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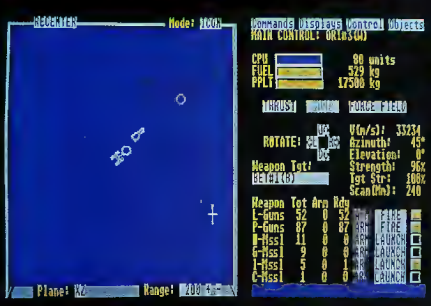

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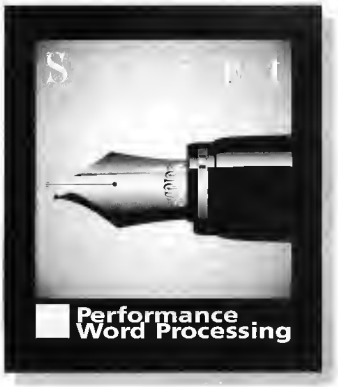

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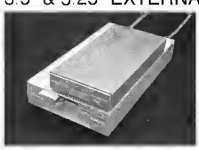

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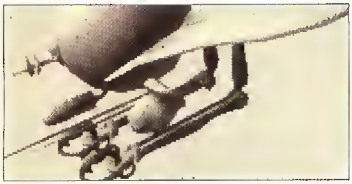

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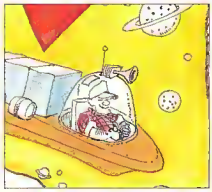

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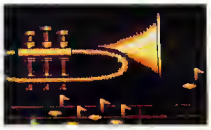

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Hello

In late 1989, Larry Flynt Publications announced that it would merge its two computer magazines — *ST Log* for the ST, and *Analog* for the 8-bit — into one huge Atari resource. A month later, LFP pulled the plug on both, bringing an era to a close and leaving START as the dominant player in the domestic market.

LFP's sudden decision also left thousands of subscribers in a lurch. Loyal readers were given few options: they could either receive a refund or subscribe to another Atari magazine. Many opted for the refund, but many more opted for the magazine. That magazine, by the way, was START.

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To all former *ST Log* and *Analog* subscribers now joining us, welcome. We guarantee you won't be disappointed.

Goodbye

Stephen Mortimer, START contributing editor and long-time news hound, is moving onto other projects, not the least of which is college. At 18, Steve already has a world of journalistic and technical experience behind him, having been the main force behind our "News, Notes and Quotes," and the defunct *ST Applications* news section before that. Good luck, Steve, and thanks for everything.

A Reminder

Beginning with the January 1991 issue, the START disk will be straight double-sided. Please keep this in mind if you only have a single-sided drive.

For those of you in the market for a new disk drive, check out START's comparison of five double-sided drives in our next issue.

Tom Byron

TOM BYRON
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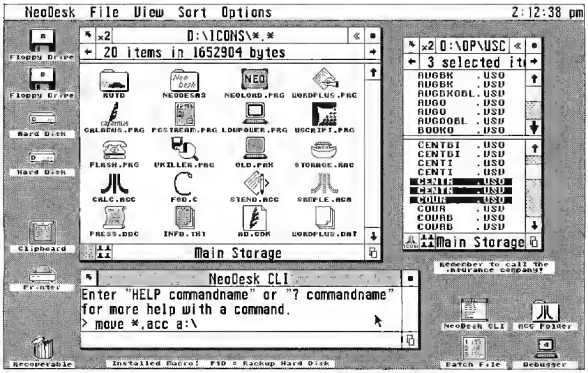

NeoDesk™ 3 is a complete replacement of the boring, built-in desktop that comes with the Atari ST. Its advanced, yet intuitive, graphical interface will make your computer both easier to use and much more powerful.

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NeoDesk introduced the idea of placing your commonly used programs directly on the desktop while pioneering the concept of assigning different custom icons for individual files and folders.

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NeoDesk is also smart, using all of its available memory for file copying so that as many files and folders that will fit into memory are read in at once. No more useless disk swaps, even hard drives benefit from its speed and efficiency.

Add some of the other NeoDesk 3 features, such as a brand new Icon Editor, keyboard equivalents, desktop picture, file templates, *Active Icons*, and *Hot Keys* (execute your favorite program with a single key), then you have more than enough reasons to buy NeoDesk. But for those of you who need a little more, read on.

NeoDesk 3 now offers a unique *File Clipboard*™ which lets you temporarily hold files and folders in memory while you are busy doing other things. In a way, you can think of it as an automatically expanding and shrinking ramdisk.

You now also have the power of *Macros*, with which you can automate any series of desktop operations like opening windows, copying files, running programs, etc. These can also have *Hot Keys* assigned to them.

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Of course, these features would not be useful unless they were easy to use. Rest assured, NeoDesk 3 has been designed to be "upwardly compatible". Use NeoDesk just like you used the original desktop, no need to forget all that you have learned.

It doesn't stop there. The included *Recoverable Trashcan* lets you recover files deleted with it at any time in the future. It was created using the *NeoDesk Developer's Kit*, which opens a whole new world of possibilities. There's also the *NeoDesk CLI* (both available separately), a complete window based command line interpreter which allows you to create pop-up menus, automate file operations, and much more.

No matter who you are, NeoDesk 3 has something for you. From helpful search capabilities to a powerful file reorder function. Thanks to its ability to remove itself from memory, it only needs about 35K of memory. Of course, there's lots more, which you can discover by ordering today!

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MULTITASKING

I'm writing to you in reference to the "Multitasking On The ST"article which appeared in the August 1990 issue. In that article, Frank Foster of Atari Corp. is quoted as saying that all multitasking systems on the ST "are kludges" and that Beckemeyer's Micro RTX and MT C-Shell, in particular "[work] but not very well."

Not all multitasking systems in the ST are kludges. At least three that I am aware of are reasonable systems. First, OS/9 is a well-known commercial operating system, which is used in many industrial applications. OS/9 is used on many systems in addition to the ST. Second, MINIX is a popular Unix-like system, with a large following. Third, there is Micro RTX, which is a robust multitasking system for the ST. Finally, there is MT C-Shell (based on Micro RTX), which is a powerful Unix-like system with TOS and GEM compatibility.

On what basis does Frank Foster claim that Micro RTX doesn't work very well? Micro RTX is the operating system used in many large applications across the country, in addition to the more than 2,500 MT C-Shell installations.

Micro RTX is used in an art supply store to run a four-user point-of-sale and accounting system. The main controlling computer is a 1040ST running Micro RTX which interfaces to two touch-screen cash registers, which are each 1040ST computers also running Micro RTX. The complete system drives four printers, two bar-code readers, two touch-screens, a Wyse-60 terminal, and the main ST console. This system has been operational for three years.

Micro RTX is used in a herb warehouse to run a multi-user, online, order-entry and billing system. This system processes some 400 invoices per day, from two input stations, both active simultaneously eight hours a day. It automates the shipping procedure by automatically printing the UPS forms.

Micro RTX is used in a limousine service in a multi-user system which processes reservations, assigns vehicles and drivers, and performs all billing and accounting functions.

The list could go on. The point is that Micro RTX is used in the real world by real companies on a daily basis and has been used that way for several years. It is powerful enough to support a wide variety of applications. It is robust enough to be used in 24-hour-per-day operations, where down-time is unacceptable. It is fast enough to support 12 users from a single ST computer. It is flexible enough to simultaneously drive many types of peripherals, including touch-screens, network controllers, multiplexers, bar-code printers, specialty-store label makers, shipping-forms printers, bar-code readers, terminals, instrumentation devices, receipt printers, and cash drawers.

In conclusion, I claim that MT C-Shell, the Visual Shell GEM interface to MT C-Shell, and Micro RTX all do what they are designed to do and do it well. Frank Foster's comments are simply not accurate.

David Beckemeyer
Beckemeyer Development
Oakland, Calif.

Jim Pierson-Perry, START's MIDI/Music Editor, replies:

Your comments are very well taken on the viability of Micro-RTX and its extensions, as were mentioned in Part 1 of the multitasking series. However, neither it or nor the other two operating systems you cite are capable (at present) of multitasking several GEM applications —markedly limiting their value for most Atari users. Minix, in particular, is primarily an experimental system for learning operating-system programming that has been described as a "hackers' toy." Please note that the article in question dealt specifically with multitasking MIDI applications. All commercial MIDI applications to date are GEM based. In addition, MIDI applications may demand consistent sub-millisecond timing, unlike the less time-critical billing or printing applications in your letter.

Foster's comments on multitasking with a 68000 based system reflect stated Atari philosophy. He never said it could not be done at all or not provide usable results. Without the additional hardware advantages of a 68030 processor, however, users are at substantially greater risk of failure from improperly written software and incur additional processing-time overhead (less noticeable at 16 or 32 MHz). There is no argument that Micro-RTX does what it claims to do; however, whether or not a general multitasking solution that is incapable of running multiple GEM programs (the bulk of user applications) can be said to work well is a subjective call.

The MIDI-Tasking system currently in development is not a general GEM multitasking system from Atari. It is specifically tailored for power users who wish to run multiple, time-critical, GEM-based, MIDI software. No existing multitasking system for the ST (unfortunately) meets this need today — regardless of how well and valuable ►

"Super-Charger is the MS-DOS Emulator of Choice" —Milt Creighton

Current Notes Magazine

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Super Charger

- The Only external IBM emulator.
- Norton factor of 4.4.
- Atari's memory can be used as a Ram Disk or Expanded Memory.*
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- Two monitor ports (DB9 & DB15) allow you to use Multisync Monitors right out of the box.
- Omniswitch functions as a monitor switcher for standard Atari monochrome and color monitors.
- Enables you to use two external floppy drives (2-3.5", 2-5¼" or 1-3.5" & 1-5¼").
- Custom designed software allows you to change resolution without re-booting.

$89.95

Acer Monitor

The Acer multisync monitor model 7015 supports an 800x600 resolution and accepts both "TTL" and "Analog" signals. It has a 14" diagonal display with a .31mm dot pitch. The Acer comes with a tilt swival base and a non-glare etched screen. The Acer monitor works on all Atari ST** and TT line of computers.

$449.00

*Call for details.

**Requires a monitor interface like the Omniswitch.

All prices subject to change— shipping and handling extra.

Talon Technology

243 N. Hwy 101, Ste.11
Solana Beach, CA 92075

(619) 792-6511
FAX (619) 792-9023

it may be with other applications.

DOUBLE-CLICKING

Using DC SEA to create self-extracting ARC files for your START disk was a good idea — hut — the resulting files will not un-ARC while I'm using NeoDesk. It's a real pain to have to exit NeoDesk to un-ARC the files. I'd rathcr you use the old ARC.TTP. At least that will run undcr NeoDesk.

Richard Bush
Overton, Nev.

I recently upgraded from my trusty eight-bit 130XE to the 1040STE. The increase in colors and the stereo sound were deciding factors, along with the available IBM and Macintosh emulators. However, when I attempted to un-ARC your July and August disks, my machine refused to cooperate. I was finally forced to take the disks to Cave Creek Computers in Seattle, where they un-ARCed them for me using an older model ST. I sincerely hope that the DC SEA compacting utility will he upgraded to support the STE model!

Kenneth G. Moffat
Seattle, Wash.

I'm having a real problem with your new START disk format. It seems that DC SEA does not work with TOS 1.4. In order to use the disks I had to bring them to a friend's house, who has a 1040 with TOS 1.0 and a Mega 4 with TOS 1.4. He also can't un-ARC the disks with TOS 1.4, but has no trouble with the older TOS. I don't think two computers can be wrong, or can they?

Michael Martini
Santa Maria, Calif.

In this case, both computers may be wrong. We have tested our self-extracting files with TOS 1.4, and they work fine. However, the version of DC SEA we have used creates files that will NOT work with the STE's TOS 1.6, or whenever NeoDesk is active. Double Click Software has released a new version of DC SEA that will work with NeoDesk and the STE, and hopefully START will have it in time to use with the December issue.

As is always the case when an operating system is upgraded, there is a period of transition when users and developers must adapt to the new OS. Some programs from past issues of START will not work with the newer TOS, and while we are unable to upgrade those programs, we will test future submissions for compatibility with TOS 1.4 and 1.6. Whenever possible, we will require programs published in START to be made compatible with all versions of the ST, and if for any reason a program cannot be made to work on certain ST's, we will notify you in the body of the article describing the program. — START Ed.

PC-DITTO II ADVICE

I'm writing this letter in response to Mr. Seeholzer's letter, which appeared in the July 1990 issue, about his problems trying to get pc-ditto II to run. I myself spent much time and effort in getting pc-ditto II running in my 1040, and I think what I've learned will help others save time and frustration.

The connection between the pc-ditto II board and the ST is a clip-on connector which goes in top of the 68000 processor. After going through the installation instructions many times I discovered that in order for the emulator to work, the connector must not he pushed down all the way. I found it needed to be about only three quarters of the way on or else the computer wouldn't even boot.

Another prohlem I had was that the connector was too loose and fell off when I tried to put the cover hack on the computer. A fix for this, although a bit risky, is to bend all the pins on the connector inward ever so slightly, making the fit tighter. If you do this, make sure the hending is very slight or else the connector will not fit at all.

Other than these now seemingly 'simple' problems, I found the installation very easy and straight forward if you follow the instructions carefully (I can say this hecause this was the first time I've ever done any electronics work myself). I hope now that others will have a much easier time with their installations than I did with mine.

Peter Tang
Surrey, British Columbia

FLOOR PLANS

Can you or any of my fellow readers give me a line on floor-plan or house-plan software for the ST? Several titles are available for the PC, however, they run excruciatingly slow using pc-ditto I. I'd appreciate any help.

Chip Bragg
Thomasville, Ga.

While I don't know of a program specifically for designing floor plans, any of the CAD packages available for the ST would allow you to draw up a suitable plan. Perhaps there is such a specific program in Public Domain Land. Readers? —START Ed.

START welcomes letters from readers; however, due to the volume of mail, we can only reply through Dialog Box. Please address your letters to:

START Mogozine Dialog Box
544 Second St.
San Francisco, CA 94107

CALLING ALL PROGRAMMERS:

START Wants You!

START Magazine is always on the lookout for new and innovative software for our monthly disk and we welcome your submissions. Due to the requests we get from our readers, however, we are more likely to accept the following:

- utilities (small programs that make using the ST even easier)
- broad-based applications (full-featured databases, word processors, telecommunications programs, etc.)
- games (preferably not shoot-em-ups)
- MIDI programs
- graphics software
- scientific applications
- programming tutorials (particularly for BASIC and C)

We would also like to see word processing/desktop publishing macros, and add-ons and enhancements for existing programs. We aren't interested in extremely specialized applications, or things like label makers, disk catalogers and simple database programs.

A special note to game programmers: the majority of our submissions are games, so a unique and intriguing premise will definitely help your chances!

Be Professional

Your submission should pay special attention to error-checking and user-proofing. Thousands of ST owners, from beginners to experts, each with a different system configuration, run the programs we publish. We want to see interfaces that are clear and easy to use. Above all, program submissions to START must do the following:

1. restore the user's Desktop color palette at the end of the program (these are the colors the user has chosen, not the default colors);

2. check to see if there is enough memory available. If not, the program must display a warning message (e.g., NOT ENOUGH MEMORY!) and exit to the Desktop;

3. give all memory allocated to the program back to GEM when the program ends. This includes resource files and GOOS fonts;

4. check the screen resolution if the program is not resolution independent. If the resolution is wrong, the program must give an appropriate error message (e.g., THIS PROGRAM RUNS IN LOW-REZ ONLY!) and make a clean exit to the Desktop;

5. make sure there is enough room on a disk before writing to it;

6. never assume that the program is running from a certain drive. Programs should look in the **current directory** (the directory from which the program was run) for their support files, and put an error message on the screen if they can't be found;

7. use alert boxes for error messages so the average person has time to read them;

8. if the program uses sound, make sure the sound chip is turned off when the program ends;

9. include a copyright notice. Put your name on it, so that it is protected! If it is bought by START, we will need to change it to reflect the new owner of the copyright;

10. include documentation that explains the exact minimum hardware requirements needed for the program to function, such as screen resolution, amount of memory, printer type, disk space, joystick, etc.

The following are suggestions on how to tailor your program to make life easier for the end-user:

- keep the number of support files as small as possible. Give them appropriate names, so that they're easily identified;
- make the program run in as many resolutions as possible;
- test the program for compatibility with TOS 1.0 (original STs), 1.2 (Megas), 1.4 and 1.6 (STEs). Notify START of any problems, or if you cannot test the program with other TOS versions;
- if possible, test the program with the various popular memory-resident programs, such as item selectors, alternate Desktops, etc. This is especially important if your program is an accessory or an AUTO-folder program! Again, notify START of any problems;
- beta-test the program! Have your friends and relatives try it. Challenge them to find as many bugs as possible. Remember that if our readers find problems with your program, START will ask you for technical support;
- don't assume people will read the documentation. Give on-screen help, explanations, or instructions.

How To Send It

Each program submission must include the following:

- a cover letter that states the name of the program, what it does and how to run it. Include your address and phone number;
- a hard copy of the article (double-spaced);
- a disk that includes the program, all accompanying files, source code and an ASCII version of the article;
- a self-addressed, stamped envelope if you wish your materials returned.

Once again, START welcomes all program submissions! We look at each and every item that we receive. We do get a lot of submissions, however, so please wait four to six weeks before inquiring about your program's status. Payment for the program will be established upon acceptance.

We look forward to seeing your work. Please send your program to:

START Program Submissions, 544 Second St., San Francisco, CA 94107

Features, Reviews, Tutorials

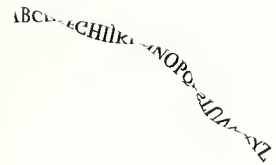
START isn't just looking for great programs, we're also in the market for articles geared toward increasing our readers' productivity: reviews of individual products, comparisons of products within categories (floppy disk drives, add-on interfaces), miniature "textbooks" on applications and hardware, and buying guides. Occasionally we'll publish standard journalistic articles, tailored to our audience, such as profiles of top Atari Corp. executives or features about the Revolution.

Your query letter should include an explanation of why you, and not one of our more established authors, should cover a particular subject or write a particular review. It should also include information on how you can be reached. Please address queries to Amy H. Johnson, Associate Editor. For author and review guidelines, send an SASE to:

START Author Guidelines, 544 Second St., San Francisco, CA 94107

(Note: START Magazine cannot be held responsible for any unsolicited material!)

The Calamus Desktop



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Nathan Potechin September 1990

CALAMUS

Calamus is a powerful, professional desktop publishing solution at an affordable price. Based on its own outline font technology, Calamus produces identical results on both the printer and the screen, for 100% true "WYSIWYG". Fonts can be scaled from 0.1 to 999.9 in 10th of a point increments. All text can be rotated 360 degrees, instantly. Printer output is very fast. There are multiple clipboards throughout the document as well as completely user-definable keyboard commands, Macro capabilities and a built-in Text Editor. Our user definable view provides complete accuracy over even the finest changes to your layouts. ***Calamus has a retail price of US $299.95*** and contains over 300 powerful features.

The Guide to Calamus Desktop Publishing

The Guide to Calamus Desktop Publishing contains 250 pages of hints, tips and tutorials for Calamus, The Font Editor and Outline Art, as well as 50 pages of Compugraphic font output examples. Created entirely using the programs it covers, ***The Guide has a retail price of US $29.95*** and is a valuable and highly recommended addition to the Calamus family. Contact ISD directly to place your order.

OUTLINE ART

Outline Art supplements Calamus with a great number of new functions and effects. It is a complete vector graphics editor for lines, Bezier curves, control paths etc, with the capability to generate freely-definable raster areas. Text attributes include; rastering, transparent, outlines, rotation, stretching, compression, cursive styles, circular text, text along a freely-defined vector path and kerning functions. An integrated, fully-programable calculator with a pre-defined and extendible library of transformations, intelligent clipboard and Copy functions and much more. Loading and saving in CVG format (Calamus Vector Graphic), allows integration into Calamus. ***Included with Outline Art, is our own Convert2X.PRG*** which allows the translations of CVG to either EPS (Encapsulated PostScript®) or PS (PostScript®) for importation into most professional desktop publishing solutions available in the market today. ***Calamus Outline Art has a retail price of US $289.95.***

Specifications and prices in this advertisement are subject to change without notice. ISD Marketing, Inc., Toronto, Canada, Tel: (416) 479-1880 Sept. 1, 1990

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"Calamus is the most powerful DTP program for the ST – or any machine for that matter."

Start Magazine April 1990

TYPOGRAPHY

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There are over 200 AGFA Compugraphic® fonts optionally available for use with Calamus. In additon there are now over 100 fonts available from Lintoype® and 1200 fonts from URW®. For more information, please contact ISD directly.

The new ***"SoftRIP®"*** for use with the Compugraphic 9000 series of Imagesetters is now available. Please contact ISD directly for more information.

Minimum System Requirements:
All Atari ST's with at least 1 MByte of RAM, a double sided disk drive and an SM124 monochrome or 19" high resolution monitor.

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This advertisement has been created entirely within Calamus, Outline Art and The Font Editor and output at 1270 DPI directly to a Linotronics L300 Imagesetter.

BY STEPHEN MORTIMER

INSIDE ATARI

Atari racked up a solid profit of $1.5 million in the second quarter of 1990 on sales of $84.9 million. Last year Atari earned $300,000 on sales of $82.7 million. Atari President Sam Tramiel attributes the increased earnings to continued strong sales of the Portfolio and greater market penetration of the portable Lynx game machine.

LEXICOR AND IMAGE SYSTEMS

Image Systems is now shipping their own 24" monochrome monitor. Utilizing integrated circuits and modular design, the monitor can be fixed easily if anything breaks. It has multi-synching capability up to a resolution of 2000 x 1500, and is compatible with the Moniterm controller board. Jay Craswell of Image Systems says the company is planning to make their own high-resolution monochrome monitor controller that will support user-definable resolutions.

Lexicor, another high-end graphics publisher, is producing three software packages offering photo-realistic editing capabilities. Prism Paint is a resolution-independent color paint program that includes page-flipping animation. Rosetta allows users to view objects from many different CAD formats, including CAD-3D, DFX and Sculpt. The draft animation program in Rosetta allows realtime animation to be produced in a moving storyboard format and then saved as a Delta file. Chronos is Lexicor's motion-control program. This complete animation package can also save animations as Delta files as well as in a custom Lexicor format.

To complement the software, Lexicor offers an image-capture and Genlock package developed by JRI. A 24-bit color board for animation is also available. Lee Seiler of Lexicor stated that his company is completing the development of the ParSec graphics-board software that will be offered in the United States by Rio/Datel.

Lexicor offers their software in a package containing TOS 1.4 and the ISAC board for $775, $25 cheaper than the retail price of ISAC. Rio/Datel markets the Lexicor hardware and software. To contact Lexicor, call (415) 453-0271.

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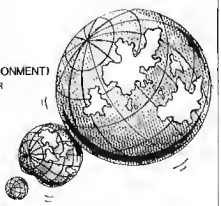

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CALAMUS SL - THE NEXT GENERATION

Calamus SL is near completion and is expected to be ready for Fall COMDEX, according to Nathan Potechin of ISD. This modular version of the desktop-publishing package includes new, major features, with color support and four-color separation first on the list.

Other advances include a module that converts a page to CVG format so that, in turn, it can be converted to Postscript and printed. (A direct Postscript driver is under development.) A new Line Art module, the modular version of Outline Art, features over 30 new functions. The Calamus SL Raster Vector module will import raster images for autotracing using Bezier curves. The upgrade policy has not been announced.

FAT BITS

• Gribnif Software's NeoDesk gets a facelift with version 3 of the best-selling desktop replacement. Low-resolution support, split windows, Desktop Notes (tm) and a file clipboard are four major enhancements. With split windows, two different parts of a directory are displayed in one window. Desktop Notes (tm) allows the user to jot down ideas directly onto the desktop. The file clipboard is an automatic RAM disk that is automatically sized as its files are copied and deleted.

• Spectre 128/GCR version 3.0 now supports the 68030 microprocessor, the heart of the TT and Gadgets by Small's processor upgrade board. Also, the Megatalk board is nearly ready. Megatalk connects to the expansion bus in Mega STs and provides both Appletalk and Mac SCSI ports. Dave Small says SCSI devices, including hard disks and CD-ROMs, can be connected directly to the board and used with Spectre.

• Goldleaf Publishing has produced two new versions of Wordflair, 1.1 and 2.0. Registered users can upgrade to 1.1 from 1.0 for $5; the 2.0 upgrade costs $50. The latest version is faster, 80K smaller, and includes keyboard shortcuts, a desk accessory for image conversion, and a spell checker, a thesaurus and a hyphenation dictionary. It supports footnotes, and comma-delimited ASCII files can be imported into its database.

More Bytes per Buck

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ReSTART

An ST Software Reset (Served Cold)

BY TOM HUDSON

START Classic is a monthly feature that presents some of the most popular programs and utilities ever included on the START disk. This month we present Tom Hudson's ReSTART from Special Issue Number Four. It's a utility that lets you cold-boot your computer with just a few keystrokes.

Resetting your ST or Mega seems like a simple task – just reach around the computer and press the reset button, right? Wrong. This is just a warm start, which means that all resident programs are thrown away (except for specially written utilities such as some "reset proof" RAM disks). A warm start leaves all sorts of garbage in memory – some of which you might not want to keep around. To really get a clean slate, you have to do a cold start, which sets your computer to the way it was when you first turned it on.

You'd think that turning off the power would take care of the problem – after all, if you turn off the power and then turn it back on, you'll get a cold start, right? Well, maybe. When you turn your computer off, memory starts to decay, and may take several seconds to totally blank out. If you turn your computer off and then on again too quickly, the memory may not decay completely, and the system thinks it's doing a warm start!

AT A GLANCE

Program:	ReSTART
Type:	Cold-boot utility
Requirements:	512K, any rez
Arcfile:	CLASIC02.PRG
Files	RESTART.PRG
Language:	MADMAC Assembler

Megas present a different problem. They have a detachable keyboard that can be several feet away from the computer and it has the reset button and power switch several feet further away! If you're like me, your desk is cluttered with manuals, magazines, monitors and modems – not to mention the magazines and manuals I usually have on my lap. Reaching around these piles and fumbling blindly behind the Mega CPU can seem like an almost Herculean task. By the time you've found the switch you're looking for, you've got the manuals on the floor, junk knocked over on your desk and a strained back for your trouble.

Enter ReSTART

Never fear, ST owners. ReSTART is here to save you from system reset-itis. With a simple keystroke

combination, the system will cold start – as if you had powered off the system, waited several seconds and powered it back on again. The reset button retains the normal operation – pressing it will give you a simple warm start, keeping those reset-proof RAM disks safe.

From your START backup disk, double-click on the archive file CLASIC02.PRG and choose Extract when the dialog box appears. Select a destination disk and the file will un-ARC directly onto that disk. Copy RESTART.PRG into the AUTO folder on your boot disk or hard drive. Now reboot your computer.

When the system starts up, you will see ReSTART's installation message appear on your screen. Once your GEM Desktop appears, you're ready to roll. Press and hold [Control]-[Alternate] on the left side of the keyboard. With these keys held down, press [Delete]. Your ST system should instantly reset to its power-up state. Amazing.

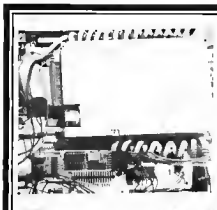
Whot ReSTART Will (And Won't) Do

You can use ReSTART with virtually every program that runs on the ST, although some programs which disable the normal ST operating system will render ReSTART inactive. I have personally tested ReSTART with dozens of commercial software packages and terminate-and-stay-resident utilities and it has worked flawlessly with them all. You should have very little trouble in most situations.

Because it is a software utility which depends on the proper operation of the ST's operating system, ReSTART is vulnerable to serious system crashes. If one of your programs bombs and you can't hear a keyclick from your monitor when you press keys, ReSTART has probably been killed, and you'll have to resort to pressing the system reset button manually or repowering up.

In order to work properly, ReSTART changes a special flag inside the ST which causes the system to return the status of [Control], [Shift] and [Alternate] when a key is pressed. Some programs may be sensitive to this special condition and may react differently than normal, but most are unaffected. ■

Tom Hudson is the author of DEGAS, DEGAS Elite, CAD-3D, Cyber Sculpt, Cyber VCR and The Antialiaser. He lives in Kansas.



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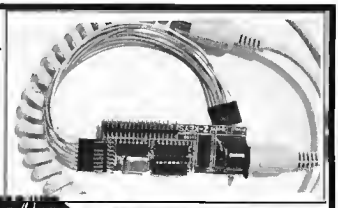

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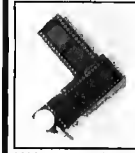

Lithium 10year battery backed-up clock and calendar module that fits in all the STs. Install it under one TOS ROM chip and all your files will be date and time stamped correctly. Comes with digital corner clock display. Frees up your cartridge port. Stop wasting time setting time! 3yr. warranty.

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Ultra low-profile solderless **520ST/520STfm** 2.5 Meg memory upgrade. Fits under all RF-Shields, including the older 520ST's with external disk-drives. Plug & Play! Comes with 1yr. warranty, detailed manual, Ramdisk software and diagnostics on disk. **$129.95** w/o RAM **$279.95** with RAM

Z-RAM/Mega2-to-4

Solderless **Mega2** RAM upgrade to 4 Meg. Plugs into the back of the Mega2 and will not interfere with internal hard-drives. The easiest way to upgrade your Mega2 without soldering! Comes with complete instructions and diagnostics. **$129.95** without RAM **$279.95** with RAM chips

520STfm/1040 2.5 to 4 Megabyte Solderless Memory Upgrade Kit

Innovative 3-D double-decker boards fit into the video-shifter metal box of the ST. Memory diagnostics and RAMdisk software included. 1yr. warranty and 30-day money-back guarantee. Super reliable data and ground connections make this the upgrade board for your ST.

Z-SIMMS STe SIMMs

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Z-SIMMs $89.95

0K(no chips) $149.95
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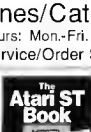

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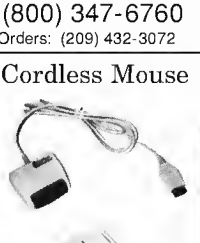

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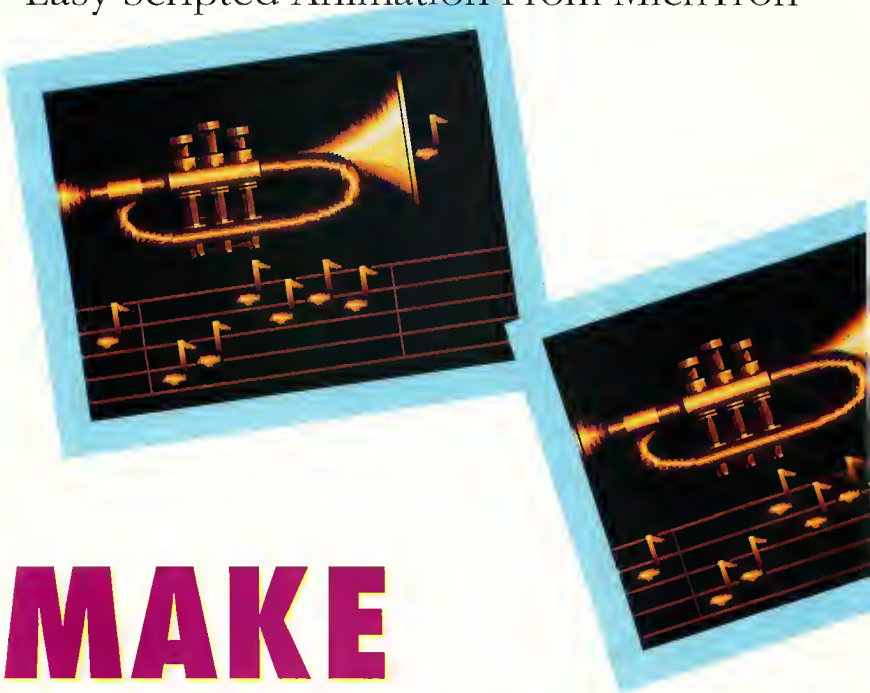
Easy Scripted Animation From MichTron

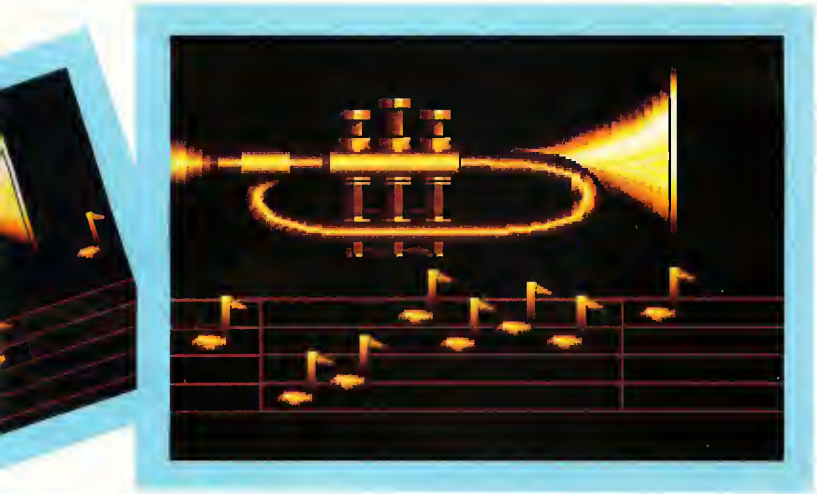


MAKE IT MOVE 2.0

Everyone loves good graphics. If you've ever wanted to create wonderful animations easily, here's your chance. START is proud to present Make It Move 2.0. With this set of three animation programs you can create complete animations, from a few DEGAS or NEOchrome images, filled with transitions and color effects — great for desktop video productions.

PROGRAMS BY RENE DE LA BRIANDAIS • ARTICLE BY ANDREW REESE, START GRAPHICS EDITOR

ON DISK



Make It Move is quite easy to use, once you understand how the animation method and the programs fit together. Read this article thoroughly before attempting to create your own animations. Several tutorials are also included on your START disk; they will not only take you through parts of the programs, but will also let you see how the effects were achieved.

Getting Started

To find the three Make It Move programs, double-click on the archive file MAKEMOV1.PRG and choose Extract when the dialog box appears. Select a destination disk and the files will un-ARC directly onto that disk. Make sure that ▶

AT A GLANCE

Program:	Make It Move 2.0
Type:	Animator
Requirements:	512K, low rez
Arcfile:	MAKEMOV1.PRG
Files:	OBJECTS.PRG SCRIPT.PRG VIEWIT.PRG

AT A GLANCE

Program:	Make It Move 2.0
Type:	Animator tutorial
Arcfile:	MAKEMOV2.PRG
Files:	CURSOR.CPR FILEBOX.CPR LESSON2.SCR LESSON3.SCR MAINMENU.CPR MENU.CPR MESS1.CPR MESS2N.CPR MESS3N.CPR SELECTOR.CPR STARTUP2.CPR STARTUPN.CPR TITLE.CPR TRUMP2.CPR

OBJECTS.PRG, SCRIPT.PRG and VIEWIT.PRG are in the same folder.

To use the tutorial files, double-click on the second archive file, MAKEMOV2.PRG, and follow the steps outlined above. You may put these files in the same path as the programs, provided you have enough disk space. Make sure the files CURSOR.CPR, FILEBOX.CPR, MAINMENU.CPR, MENU.CPR, MESS1.CPR, MESS2N.CPR, MESS3N.CPR, SELECTOR.CPR, STARTUP2.CPR, STARTUPN.CPR, TITLE.CPR, TRUMP2.CPR, LESSON2.SCR and LESSON3.SCR are in the same folder.

Quick Start

To view the tutorials right away, double-click on VIEWIT.PRG from the Desktop. VIEWIT.PRG is a viewer program that you can distribute freely with your animations, as long as you don't remove any of the opening copyright notice screen. You may skip over the opening message (once you have read it) by clicking either mouse button once. When the file selector box appears, it will display only files in the path with .SCR (script) filename extenders. If necessary, change the path to that in which you un-ARCed the tutorial files and click on one of the tutorial script files, LESSON2.SCR or LESSON3.SCR. After a few moments of loading files, the tutorial will begin to run.

If you want to stop the tutorial (or any other animation being shown with VIEWIT.PRG) or change to another lesson, simply right-click. If you want to quit Viewit, once you've halted an animation, simply click on the Cancel button in the file selector.

You can also view the tutorials using the Script program, SCRIPT.PRG. If you have a 520ST, however, you will need to get rid of any accessories or AUTO folder programs, including the program that boots your hard drive (if any), to have enough memory.

The first step is to create your images in a paint program.

Defining Your Animation Objects

The first step in using Make It Move is to create your images in DEGAS Elite, NEOchrome, Cyber Paint or any other paint program you have. (*Editor's note*: You can also use SEURAT from the March 1989 issue of START.) Make It Move is not a paint program; you cannot create artwork with it.

Now, unless you're Super Animator, you should sit down and plot out each step in your animation with a storyboard, a shorthand graphic outline. With your storyboard in hand, you can then think about what your backgrounds should look like, the nature of your foreground objects and whatever special effects you're going to want.

Another thing you'll need to think about is the color palettes of your images. Make It Move will always use the background color palette to display the background as well as any foreground objects. In the absence of a background, the foreground object's color palette is used. If you want to mix and match pieces of your animation easily, use a single palette for all of your images.

If you want an object to zoom in or out, make sure it's on its own screen in the largest size you want it to be. Also, all objects should be surrounded by the background color (the key color or color 0) for the results. Finally, Make It Move will only load NEO and un-compressed DEGAS files (.P11). If you are using a program that saves images in compressed DEGAS Elite format, turn compression off before saving.

Now run OBJECTS.PRG. This program module lets you define portions of a DEGAS or NEOchrome image as cels to animate. You can load two different screens into separate buffers and cut and paste objects between them. Your first choice, however, is between the FILE and PROCESS menus, and QUIT. Unless, you're already tired of animation (!), click on FILE, then READ and then select your file type. (CMPRSD is Make It Move's own compressed file format that includes object definition information along with image data.) You can also use the Objects program as a simple way to swap formats, since you can load an image in one format and save it in another.

Click on PROCESS and then DEFINE. Click at the upper-left corner of an object and then again at the lower right. A box appears for you to give it an eight-character name; this is only a definition, not the image filename. You may continue in this manner until you have defined all the objects you want to move or show. If you want to define two different objects with one object completely within the other, always define the smaller first.

You can also load a screen with a

single object on it and convert it into a zoom object. After loading the screen, choose PROCESS, MORE, ZOOM, and whether you want the zoom to occur in one or both dimensions. Make It Move begins the process. You can let the program zoom the object down to nothing or stop it at any point. Once you stop the process, you can save it. If you don't like what you see, try again.

Other options are available from the SELECT branch. First, you must select an object by clicking within its borders. Then you can COPY it to another location on the image, SWAP its definition to the other screen or RENAME it. (Try to keep your object names meaningful; it'll help later on.)

To SWITCH between your two screens (and to load a second screen initially), click on FILE, MORE, then SWITCH. You may also DROP a screen from memory using the FILE, MORE, DROP sequence.

Once you've defined all your objects and zooms, save your images as compressed program files, using the FILE, WRITE, CMPRSD sequence. Assign a filename of up to eight letters (Make It Move automatically adds its own .CPR extender.) Then select QUIT.

On to the Show

Defining your objects is just the beginning. SCRIPT.PRG lets you take your previously defined cels and images and combine them with zooms, moves, color effects and transitions.

It's a bit finicky about what accessories are installed. (For example, MichTron's own Juggler II doesn't run from within SCRIPT.PRG.) If you have trouble, try eliminating your accessories and AUTO folder programs.

Double-click on SCRIPT.PRG from your Desktop to get the control screen. The SCRIPT area is at the top and three options, LOAD, CHANGE and QUIT, are in the MENU area at the bottom. At the very bottom of the screen, the available memory for Make It Move is displayed, along with two words in yellow. The left word always represents the activity of the left mouse button; the right word represents the activity of the right mouse button. At this point, you can either load one of the tutorial scripts from your START disk or create a new script using your previously defined objects.

Once you load a script (or a portion of one), a row of icons appear in the SCRIPT area. Each icon represents one of the events in your animation. If all the events do not fit on one screen, a small yellow arrow appears in the right margin, indicating there are more. To scroll through your script, click on the up or down yellow arrow. The small number above the upper-leftmost icon is its number in the script, beginning with event number one.

Script Functions

The Script program uses a set of ►

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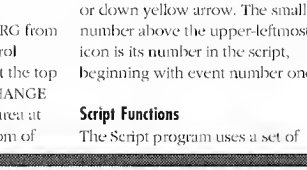

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nested menus to call functions. Here is a brief description of them.

2 FADE: Fades one image to black, and then fades back from black to the second image.

ACCEPT: Saves color changes in the current palette.

BLACK: Fades one image to black.

BLUE D: Reduces the blue component of any selected color.

BLUE U: Increases the blue component of any selected color.

CHANGE: Changes an existing script.

CHOOSE: Changes an existing color.

CLEAR: Removes all images and scripts from memory.

COLOR: Changes one or more of palette colors (in as little as 1/60th of a second). This change does not affect images in memory.

CONT: Calls a script for viewing from the first full screen event preceding the current event (indicated by the yellow box).

CURRNT: Designates a script point as the first or last event in a partial script save.

CUT: Creates a transition from one image and palette to another.

DELAY: Adds a specific timed delay in a script.

DELETE: Deletes the current event.

DISOLV: Breaks up one image through a confetti-like dissolve to fade into another. You can control the size of the confetti to control the speed of the dissolve.

END: Selects the last event in the script as the final event in a script save.

FADE U: Creates a transition from one image to another by rapidly fading up on the second image.

FREE: Releases memory used by an image. (Don't use this option if you are going to need to use an object from that image later on in the animation; the program won't be able to find it.)

FRONT: Places one object in front of others.

GREEN D: Reduces the green component of any selected color.

If you don't like what you see, try the ZOOM again.

GREEN U: Increases the green component of any selected color.

HIDE: Removes any object from the screen.

LOAD: Loads a script. The process runs through the entire script and performs all of the image READs. You may interrupt this performance by right-clicking, but if there are any unperformed READs, the program will not be able to find related objects.

MARK: Creates a place-holder in the script. A MARK does not affect the animation.

MODIFY: Changes features, such as speed or location, of existing events.

MORE: Reveals subsequent menus.

MOVE: Moves an object anywhere on screen (after the speed in pixels per step is defined). Left-click to see the MOVE; right-click to accept it.

NOTE: Adds scratchpad notes (up to six lines of nine letters each) in a script.

OBJECT: Adds an event that affects an object, such as a SHOW, MOVE, FRONT or HIDE. Select OBJECT after choosing modify to change the object.

PLACE: Changes the location where objects appear and disappear.

QUIT: Exits the program.

READ: READs in an image file.

RECALL: Acts like an Undo for the last DELETEd event. A RECALLed event will be inserted in the script immediately before the current event.

RED D: Reduces the red component of any selected color.

RED U: Increases the red component of any selected color.

REPEAT: Loops the end of a script to the beginning for a continuous run.

RUN: Lets you view an animation from the beginning.

SAVE: SAVEs all or a portion of a script to disk. After entering a script filename, select the first event in the script to save by either choosing START, or clicking on a specific event. Then click on CURRNT. Select the final event by choosing either END or VIEW to see the events. Click on CURRNT again.

SCAN: Runs a script at high speed from beginning to end.

SCREEN: Displays a full-screen image. Left-click through the available images and right-click to select the one you want to view.

SHOW: Displays objects on the screen. Left-click inside an object's defining rectangle to select it; left-click outside the rectangle to cycle on to the next image. To select a zoom object, right-click on it.

SKIP: Hops through the script from one MARK to another.

SPEED: Sets the speed of any event, except a zoom, in pixels per step.

SPIRAL: Creates a transition from one image to another in a rectangular digital spiral.

SQUARI: Creates a transition from one image to another, with the second image fading in from the outside edge.

SQUARO: Creates a transition from one image to another, with the second image spreading out from the center.

START: See SAVE.

STEP: Marches through an animation one event at a time.

TIME: Changes the time associated with certain events.

VIEW: Previews an animation from the first full-screen event to the end of the script.

VSTRIP: Creates a vertical venetian blind transition from one image to another.

WAIT: Requires an event to wait for a left-click; a right-click stops the animation.

WHITE: Fades from one image to white.

WIPE D: Creates a transition from one image by lowering the second image from the top of the screen to the bottom.

WIPE L: Creates a transition from one image by spreading the second image across the screen from right to left.

WIPE R: Creates a transition from one image by spreading the second image across the screen from left to right.

WIPE U: Creates a transition from one image by raising the second image from the bottom of the screen to the top.

ZOOM: In order to add a ZOOM event to your script, you must first READ a ZOOM file, then select ZOOM. If you already have ZOOMed or SHOWN a ZOOM object, you can ZOOM it off; otherwise, you can only ZOOM it onto the screen. Click on ON. Here you'll be asked to set the duration of the event (the time before the next event takes place). Then, you'll cycle through each previously READ ZOOM file; left-click to go to the next file or right-click to choose one.

The next step is to set the starting point of the ZOOM; move the cursor to the point where you want the ZOOM to begin and left-click. To set the endpoint of the ZOOM, move the cursor (and the "attached" ZOOM object) to the point where you want the ZOOM to stop. Left-click again to see the actual zoom. If you like it, right-click; if not, left-click to start over.

Conclusion

We hope you enjoy Make It Move. We're glad to be able to bring it to you in START. ■

Andrew Reese was formerly Editor of START and is now START's Graphics Editor and publications manager at a San Francisco Bay Area graphics software company.

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ST!

Desktop Video On The ST Is Easy And Affordable

BY WILTON A. VARGAS P.
ADDITIONAL MATERIAL BY MICHAEL PERRY

Almost everyone has a VCR and with low-priced camcorders now making their way into the market, home videos are easier than ever to make. Let Wilton Vargas show you how to produce quality videos just like the pros.

Computer-generated imagery is a staple of almost every commercial television broadcast. Consider the NBA's surrealistic shot of a basketball flying through the hoop, shown from a vantage point that mimics an impossible camera position poised inches above the flying ball; or the ubiquitous 3D, high-tech, station-identification logos that spin wildly into view. Even a garden-variety title scrawl at the end of a TV show requires sophisticated hardware and software to create the letters and then marry them to a video image.

Until recently, computer-generated video has been exorbitantly expensive; to make a simple 3D logo, a video house would bid at least $1,000 per second. For something as complex as the NBA promo, prices could easily escalate into the hundreds of thousands of dollars. But just as desktop publishing brought professional-quality hard copy into the hands of ordinary folks, a similar revolution is underway in the the world of video. Desktop video is here and the ST can be employed as the heart of a powerful electronic graphics system to create breathtaking imagery similar to that seen on television.

Desktop video is a broad term encompassing a variety of applications, but includes essentially anything that can come out of a microcomputer and be recorded to videotape. Familiar examples include video-titling systems; video paintboxes that make charts, slides and illustrations; and animation workstations that are used to create 3D logos, simulations or just about anything you can imagine.

Titling is the simplest and most widely used DTV application and draws on the computer's graphics power to generate letters using different colors, fonts and designs and then record them to videotape or superimpose them over a live video signal. ▸

JEFF BERLIN

A paintbox system is used to create drawings, charts and illustrations and to modify pictures brought to the computer via a digitizer or frame grabber. Paintbox systems are similar to drawing programs in many respects, but are typically more powerful and capable of outputting to video.

DTV Animation

Animation is the most exciting DTV application, available until recently only for large sums of cash. Computer animation refers to any computer graphic that moves and can include titles that crash out of the screen, simple animations, or entire worlds that never existed anywhere but inside the computer.

Three terms are generally used to describe computer animation, each more complex than the previous: 2D, 2-1/2 D and the full-blooded, 3D animation. All are available on the ST.

Two-dimensional animation has no perspective or depth. The game Breakout is a good example; all the action is "flat," taking place on a single plane.

The next level up, 2-1/2D, incorporates multiple planes of 2D animation, creating some basic depth relationships. Each level is still flat, but it's obvious that some planes are in front of others. Most television cartoons use 2-1/2 D animation (usually rendered by hand, although the 2-1/2 D layering concept is the same.)

Three-dimensional animation, the Holy Grail of computer-generated imagery, portrays moving 3D objects with perspective, depth and shading. The NBA promo is one example, but 3D animation is used to generate everything from flying spaceships to network logos.

All of these types of DTV tools are available to anyone with a VCR and an ST. Your budget and desired use determine what an optimal setup might be. For casual use, a title generator for home videos may be sufficient, whereas a company that wishes to incorporate attention-grabbing graphics into video presentations may wish to dive head first into a top-notch, 3D, video-animation system.

HOW TO USE YOUR ST AS A VIDEO TITLING SYSTEM

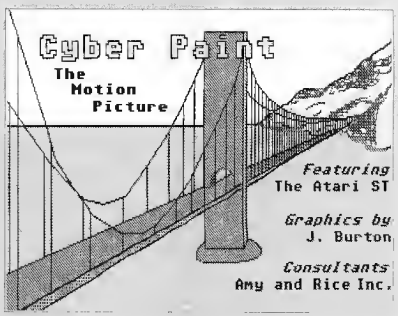
For the purposes of this tutorial, we will use Cyber Paint from Antic Software. Since most drawing programs include some of the features we will use in Cyber Paint, you can adapt this tutorial to the program of your choice.

If you own a Genlock, then you have the ability to superimpose the text over video, just like TV newscasts, where they put the name of the person over their image.

First, go to the Palette menu and set the background color to black (000) so that the video shows through. If you don't own a Genlock, you can still create nice title pages for your video productions, although they cannot be superimposed over video.

Next, enter the Fonts menu, click on Custom and then select a font from the FONTS folder on your Cyber Paint Data Disk. (Note: Since Cyber Paint uses GDOS fonts, there is a wide variety of public-domain and commercial fonts available from which to choose.)

After you choose your font, select a style from the different effects available in the Fonts menu (i.e., italics, bold, etc.). If you're creating headline text, use italics to enhance it. Finally, search for the place on the tape where you want to record (or insert) the title page or letters; put the VCR in the record/pause mode. If you're opening your video production with the title page, it is nice to use a fade-in-from-black or an ADO effect, since appearing from nowhere is not a good approach to present a video production.



An example of the effects you can achieve by using different background designs to create a title page.

First, The Hardware

A note about hardware is essential. First, graphics are memory hogs. One color image can take up as much disk space as a 200-page document in a word processor. If animation is incorporated, 30 of those images are required *each*

second and even though most animation programs use compression schemes to minimize file size, it's easy to see how the megabytes disappear. A hard drive and at least 1MB of RAM are essential for heavyweight applications and make simpler programs work faster.

Second, if it's to be desktop video there must be a way to record the finished product onto videotape. Even though the ST's monitor looks an awful lot like a television, it's not. Television is broadcast using a 50-year-old system called NTSC (National Television Standards Committee, disparagingly referred to by engineers as "Never Twice Same Color") that crams all the sound and imagery of broadcast television into one radio signal, which is in turn decoded by home televisions. The ST, and most computers, use completely different schemes to drive their monitors, usually an RGB (Red-Green-Blue) setup which has different signals for each color and a fourth for sound. What is needed to cross the bridge is something that translates the monitor's image into a "composite" signal that VCRs and televisions can use.

Two solutions are available. 520STFMs include a video encoder. Late-model 1040STs can use the Monitor Master from Practical Solutions to generate a video signal. For other STs, a slightly more expensive encoder is required. A popular choice is Video Key, also from Practical Solutions, which provides a stable, clean video signal. A word of warning: steer clear of "composite cables" — they'll provide a signal, but only in black and white.

Next, your VCR must have an RCA video-in jack, which looks similar to a connector on a stereo. Most VCRs sold today do, but older models have only a multipin camera cable. If yours has no video-in, check with your video store to purchase an adapter.

Any of these options will let you record images from the ST. However, if you want to combine computer graphics with an outside video source, such as placing titles on-screen over action or incorporating a computer-generated picture as a backdrop for live actors, you need what is known as a genlock. A genlock can be simply described as a device that marries the computer-generated graphics with a live-action video signal to produce an image that incorporates both, in a form that can be recorded to tape. Currently, the only unit available is the JRI Genlock System for the Mega, which is an internal unit. An external genlock for the new STE (which has RCA video jacks) will be available soon.

The ST can be employed as the heart of a powerful electronic graphics system to create breathtaking imagery similar to that seen on television.

Then The Software

As an ST user, you may already own software that falls under the DTV umbrella. Three popular and sophisticated drawing programs provide a variety of tools to render geometric shapes, fills and text, all of which, with the right hardware, can be recorded to tape. DEGAS Elite (Electronic Arts — discontinued), NEOchrome (Atari Corp.) and Spectrum 512 (Antic Software) are useful for preparaing still pictures, designs and charts. Their text capabilities let them double as character generators for video. Recently, two programs have been released that were specifically designed for character generation: Videotext from Water Fountain Software (reviewed in the July 1990 issue of START) and TV Titles 2.0 from Paul Deziel (reviewed this issue).

Powerful animation programs, like Antic's Cyber Paint, are available that let you create alternate worlds, make drawings fly, spin, rotate or whatever your imagination cooks up. Whether it's a spaceship or a company logo, chances are that a respectable job can be done on the ST, using Cyber Paint.

(Please see the sidebar entitled "Desktop Video Buyer's Guide" for more information on the availability of graphics and animation programs for the ST.)

System Add-Ons

As mentioned, the only genlock available at this time is the JRI Genlock System for the Mega (see the sidebar "The Missing Link"). However, it is very expensive ($650) and may not be practical for the home user. Also mentioned earlier, a genlock for the STE is reportedly ready for release when the machines start selling. Plus, JRI's SIMM memory upgrade for 520s, 1040s and Mega 2s provides the connections for an external genlock that will be available by the time you read this.

JRI's ST4096c Board increases your ST's palette from 512 to 4,096 colors. This enhancement follows the guidelines of future Atari hardware such as the STE and the TT and is compatible with all software. It includes a patch program that will let NEOchrome take advantage of the increased colors.

A *video digitizer* captures images from a video source such as a VCR or ▶

THE START BOOKSHELF

Handy References For The Budding Videographer

Books

Digital Video In The PC Environment by Arch C. Luther, $27.95. McGraw-Hill Publishing Co., 1221 Avenue of the Americas, New York, NY 10020.

Getting the Most Out of Your Video Gear by Gerald V. Quinn, $12.95. Tab Books Inc., Blue Ridge Summit, PA 17214.

How to Make Money with Your Video Camera by Rick Schmidt, $8.95. NAL Penguin Inc., 1633 Broadway, New York, NY 10019.

Today's Video: Equipment, Setup and Production by Peter Utz, $40 (hardcover). Prentice-Hall Inc., Englewood Cliffs, NJ 07632.

Using Your Camcorder: Techniques for Creating Better Home Videos by Mandy Matson, $18.95. Watson-Guptil Publications, 1515 Broadway, New York, NY 10036.

The Video Movie Maker's Handbook by Frank Ledlie Moore, $12.95. New American Library, 1633 Broadway, New York, NY 10019.

Magazines

Video, *monthly,* $2.50 newsstand, $15/one-year subscription. Reese Communications Inc., 460 W. 34th St., New York, NY 10001.

Videography, *monthly,* $3 newsstand, $25/one-year subscription. P.S.N. Publications, 2 Park Ave., Suité 1820, New York, NY 10016.

Videomaker, *monthly,* $2.50 newsstand, $29.80/one-year subscription. Videomaker Inc., 1166 East Lassen Ave., Chico, CA 95926.

Graphics Programs In *START* Magazine

Back issues of *START* are available from Antic Publishing for $14.95 for magazine with disk or $10.95 for disk only. To order, call toll-free, (800) 234-7001.

ANI-ST (November 1990): A shareware program that offers metamorphic (tweening), cel and color-cycling animation — a good first animation program.

CAD-3D 1.0 (March 1990): Tom Hudson's original computer-aided design software. This powerful program lets you render 3D images with graceful ease.

Creation (Summer 1988): Another Tom Hudson original; creates random fractal landscapes and saves them as 3D objects for use in CAD-3D 2.0.

Make It Move (This Issue): MichTron's animation tools specially suited for desktop video applications.

Pixel Pro (Fall 1987): provides several graphic manipulation functions.

RezRender (November 1989): renders CAD-3D objects in your choice of several rendering techniques. Includes a tweening function.

SEURAT (March 1989): Full-featured paint program; saves images in DEGAS picture format.

a video camera and transfers them to your ST. The most popular is Digital Vision's ComputerEyes ST, which digitizes in 16 colors. When coupled with Trio Engineering's DigiSpec, the fun really begins since it will digitize in 512 colors.

A *scanner* transfers (scans) what you have on paper to the computer. A good, low-cost scanner is the IMG Scan from Seymour Radix. It installs on the printerhead. You then insert the material you want to scan into the printer and — presto! — your image is transferred to the computer. Desktop publishing aficionados already know how effective a scanner can be.

A *frame grabber* is a hardware device that captures frames of video. The only one available for the ST at this time is VIDI-ST from Rombo Productions (reviewed in START, May 1990). It captures frames at a rate of almost 30 frames-per-second in 16 colors. On a 1MB machine, you can store up to 50 frames.

Audio digitizers add digitized sounds to your animations. ST Replay from Michtron is one of the most popular for the ST. The Audio-Video Sequencer (START, November 1988) also works very well.

Putting it All Together

Given that owners of VCRs vastly outnumber owners of the ST (or any microcomputer, for that matter) the ability to record images on videotape turns an ST into a viable mass-communication tool. While output from the ST is not absolutely "broadcast-compatible," neither is anything generated on an IBM at the time of this writing. However, for corporate communications or home video, an ST equipped with the right combination of software and hardware can be used to communicate any idea the user imagines.

Of course, we haven't reached the end of the road in DTV products and applications for the ST, not by a ▶

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longshot. As you read this, the STE is available at your local Atari dealer. Among its many enhancements, this upgraded ST offers a 4,096-color palette, an RCA video jack, and hooks for an external genlock. (*Editor's Note:* A review of the STE is scheduled for the December 1990 issue of START.)

For the present, your ST offers you the power of professional-level video production without the prohibitive costs. Now you can add desktop video to the list of amazing things you can do with your ST. ■

Wilton A. Vargas P. is president of Digital Magic, a computer and animation company based in San Juan, Puerto Rico, that uses Atari hardware and software for most of their work. ***He would like to thank Elik Diaz for his help in preparing this article.***

THE MISSING LINK

JRI's Genlock Explored

BY WILTON A. VARGAS P.

The JRI Genlock System lets you combine computer-generated images with an external video source such as a VCR or a video camera. In addition to being a genlocking device, it's also an encoder that lets you run your ST on any television. But what makes this board so special is that it accomplishes the genlocking process entirely through hardware. This means that all your software is automatically compatible with it. Furthermore, when genlocked to an external video signal, the board delivers a broadcast-quality RS170A NTSC signal for the first time on an ST.

There are several reasons why the built-in encoder included on STFMs cannot produce a high-quality video output, which eliminates its ability to genlock. First, the ST's video bandwidth is higher than the standard NTSC's; it is not possible to synchronize those two signals. Second, the signals of built-in encoders found on STFMs and produced by hardware add-ons such as VideoKey do not adhere to NTSC standards, making it impossible to synchronize these signals with professional video equipment because none of them are "interlaced" (i.e., a way to increase video resolution by doubling the number of horizontal scan lines then rapidly displaying them alternately. NTSC-standard video is interlaced).

AT A GLANCE

Product:	The JRI Genlock System
Company:	John Russell Innovations Inc. P.O. Box 5277 Pittsburgh, CA 94565 (415) 458-9577
Price:	$650
Requirements:	Mega, television
Summary:	A must-have for anyone who's looking for professional-quality video output.

Two Ports

The Genlock consists of two parts, the board itself and the remote-control unit. It also comes with an instruction manual and a disk that includes demos. Also on the disk is a DESKTOP.INF file that sets the Desktop colors in such a way that when genlocked to external video, the Desktop is shown over the moving image. The board, contrary to early reports, does not make use of the Mega's internal bus port. Instead, it fits into the socket of the video-shifter chip. Installing the board is very easy for an experienced hacker, but I recommend that the installation be done by your dealer, or JRI will install it for you.

The Genlock adds five additional ports to your Mega: Composite Video In (RCA connector), Composite Video Out (RCA connector), Audio Out (RCA connector), RGB/Computer, RGB/Genlock (both RGB connectors are the standard Atari monitor connectors) and finally, Remote (DIN connector). Furthermore, the Genlock sports the following three adjustment knobs: horizontal position of the computer graphic, hue of the incoming video signal and lock. Lock is for adjusting the Genlock's synchronization signal with that of incoming video. The only time you may need to use it is when you try to genlock with a poor sync signal (such as the one from a poor-quality tape).

Internally, there are four additional adjustment knobs for burst, bright, chroma and contrast. This means you can adjust the Genlock (with the aid of a vectorscope) to provide the best possible signal.

Monitor Ports

The port labelled RGB/Computer shows a graphic as it is transmitted from the computer and is independent of the remote-control unit. The second port, RGB/Genlock, lets you

continued on page 40

¿HABLA DESKTOP VIDEO?

Common Video Terminology

COMPILED BY WILTON A.VARGAS P.

ADO (Ampex Digital Opticals): The trademark for a device used in TV stations and post-production houses to accomplish image transitions and special effects (page turns, mosaics, flips, rotations, size variations, etc.) with video.

Aliasing: A common display problem with computer graphics in which an image is displayed with jagged or stair-stepped edges (better known as jaggies) on diagonal lines, due to low pixel resolution.

Anti-Aliasing: A technique used to hide or smooth jagged edges in computer graphics by softening the transition between the foreground and background by interpolating intermediate shades of color between the two.

Cel: A single frame of an animation. The term originated in cartooning when the artist drew each image on a sheet of celluloid film.

Character Generator (or CG): A dedicated hardware device that creates text for use in video.

Chroma: The portion of a composite video signal providing color.

Chroma Keying: A widely used process in film and video production in which a subject is filmed or taped in front of a blue or green screen. When the film is processed, the blue (or green) area is eliminated, leaving only the subject. The film can then be combined with another background, creating a singular, composed image.

Color 0: The color that was previously specified to become transparent when the computer graphics are overlayed on a video signal via a genlock. Everywhere in the image that color 0 appeared is now replaced with the video signal.

Composite Video: A single signal composed of chroma, luminance and a sync signal. It is currently the U.S. standard for television.

Digitizer: A hardware device that takes the analog video signal from a camera or VCR and converts it into digitally-defined pixels that a computer can display and modify.

Encoder: A hardware device that takes the individual components of an RGB signal and adds both horizontal and vertical sync signals to create a composite-video signal. The 520STFM and 1040STFM both come with a built-in encoder; 520s and 1040s that do not carry an M in the model name and Megas do not.

Frame: A complete video picture made up of 525 scan lines that are redrawn every 1/30 of a second in a standard NTSC broadcast.

Genlock *(generator locking)*: A hardware device that extracts synchronization signals from incoming video and locks the computer's sync generator with that of the incoming video's source. The word is also used as a verb to describe the syncing of video equipment.

Interlacing: A method of increasing video resolution in which the number of horizontal scan lines are doubled then refreshed (rapidly displayed) alternately. NTSC-standard video is interlaced.

Keyer: A device (usually part of a genlock system) that overlays the computer's graphics on a video image.

Luminance: The brightness portion of a composite signal.

NTSC System: The National Television Standards Committee's television standard, used in the United States and Japan.

Overscan: A feature (of hardware and/or software) that lets a graphics program use the entire video display area, creating a borderless image.

Paint Box: A specialized hardware system that lets you use a mouse or drawing tablet to create images for video or print.

Resolution: The number of pixels that can be displayed horizontally and vertically on a video screen.

RGB (Red-Green-Blue): A computer's method of displaying colors as three separate signals instead of the combined signals found in composite video.

RS-170A: A video industry standard to insure proper synchronization and levels of video signals and components.

Tweening: Drawing the cels between the key frames of an animation sequence. Some programs use interpolation to do this automatically.

Switcher: A device through which multiple video signals are sent, manipulated and assigned.

Sync Generator: A device that generates various types of video-synchronization signals, which are used to genlock (sync) video equipment together.

Sync Signal: The portion of a composite video signal that coordinates the transmitter's signal with the receiver's display.

VTR (Video Tape Recorder): The professional counterpart of a consumer VCR.

Y/C: Used to describe the separation of luminance and sync from chroma. In the near future, this method may replace composite video. This is the same technique used to achieve a slightly better and cleaner picture in ED-BETA and Super VHS (S-VHS).

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see the combined signals of the computer and the external video. In real-time situations, such as on-line video titling, you can use the Computer port as a preview monitor prior to sending the signal out for broadcast.

The wired remote control contains three switches and a fader knob. The switches control several features: Genlock ON/OFF, Mode Color/Mono (it supports monochrome, though no genlocking is possible and you'll not see the ST's high resolution mode in a normal TV or monitor) and Keying On/Off. The fader is used to perform fast or slow fades. If the Keying switch is off, you'll fade from video to computer; if on, your graphics will lay over the video image.

When genlocking, keep in mind that the input signal must be of high quality in order to obtain the best results. A poor-quality signal forces the video to shake, because the Genlock cannot sync correctly to the incoming signal. Transitions using the fader are smooth and keying is clean. By planning your animations with the capabilities of the Genlock, you can create great special effects.

Perfect For Professionals

JRI's Genlock is perfect for professional video producers, because they can record on high-quality Betacam, 3/4- and 1-inch videotape recorders, for results as close to the original as possible. Plain old VHS just can't do justice to computer graphics.

But for those mere mortals who can only afford a Super VHS (S-VHS) video cassette, JRI will have ready, by the time you read this, the Super VHS upgrade (about $100) which will provide one set of S-VHS input/output jacks; the output signal will be much better due to the increased resolution offered by S-VHS.

Although expensive, the JRI Genlock is a necessity for anyone who wants to produce professional-quality video productions. ■

DESKTOP VIDEO BUYER'S GUIDE

The Anti-Aliaser, $19.95. Tom Hudson, P.O. Box 3374, Shawnee, KS 66203.

A desk accessory to anti-alias your CAD-3D/Cyber Control animations automatically in the rendering process.

The Cyber Family, Antic Software, 544 Second St., San Francisco, CA 94107, (800) 734-2001 in the U.S.; (415) 957-0886 in Canada.

Cyber Studio, includes CAD-3D 2.0 and Cybermate ($79.95). CAD-3D is the main program of what was once the most powerful 3D rendering system available for any microcomputer. Wish-list features such as 3D animation, full perspective, shading and lighting let you draw and render objects such as robots, spaceships and skeletons.

Cyber Paint ($29.95) is powerful 2D and 2-1/2D animation software. It works as a post-production and touch-up program for CAD-3D drawings, as a video titler and as an excellent drawing program. Use Cyber Paint to create professional-looking animation sequences.

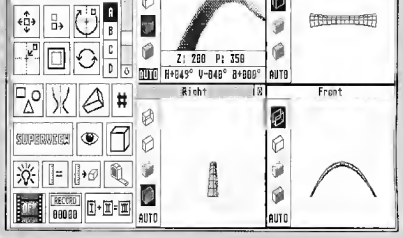
Cyber Control ($49.95) is a motion-control language that works in conjunction with CAD-3D. With this BASIC-like programming language, all of the functions of CAD-3D can be controlled. Cyber Control also enhances CAD-3D with new capabilities, such as two additional "cameras."

Cyber Sculpt ($89.95) and **Cyber Texture** ($49.95) are advanced modeling and texturing tools that complement CAD-3D, allowing for even more complex objects and scenes.

Several collections of objects rendered professionally in CAD-3D for modification or to use as-is are available from Antic Software. These **Design Disks** ($29.95 each) include furniture, architecture, human beings, cartoons, microbots and video titles. Two 3D-font collections are also available.

DEGAS Elite, Discontinued. Electronic Arts.

Though DEGAS Elite is no longer available (Electronic Arts considers it dead and buried), it still deserves mention because it includes absolutely everything a good drawing program should and its file format — .PI1 for low resolution, .PI2 for medium and .PI3 for high — is widely recognized as a standard. Its features run the gamut from simple free-hand drawing to sophisticated color-cycling animation and picture



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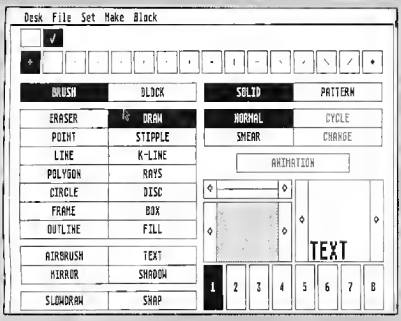

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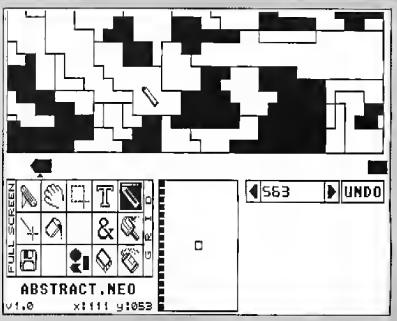


NEOchrome

distortion functions. DEGAS Elite uses GDOS to make use of the different fonts available both commercially and in the public domain.

NEOchrome, $39.95. Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94086, (408) 745-2000.

Atari's popular paint program shines with simple, straightforward menus, which belie a powerful drawing program packed with features such as color cycling and block manipulation. NEOchrome has two features not found elsewhere: the "Jack Knife," which permits cutting and pasting of an irregular-shaped block, and the ability to access the ST's extended character set.

Spectrum 512, $69.95. Antic Software, 544 Second St., San Francisco, CA 94107, (800) 234-7001 (U.S.); (415) 957-0886 (Canada). The only program that permits the ST's 512 colors to be visible simultaneously, it sports sophisticated color manipulation tools which could be used, for example, to change the eye color on a digitized photo from brown to blue. An included anti-aliasing function uses an algorithm to soften the perception of jagged edges on diagonal lines. Spectrum 512 reads NEOchrome and DEGAS Elite files and can be used as a title page maker.

(Author's Note: Combine the strengths of DEGAS, NEOchrome and Spectrum 512 to create a great title page with fonts from the first, custom block-outs from the second and a 512-color gradient-fill background from the third.)

DigiSpec, $39.95. Trio Engineering, P.O. Box 332, Swampscott, MA 01907, (617) 964-1673.

Converts digitized images to Spectrum format.

Videotext, $125. Water Fountain Software, 13 17th St., 3rd Floor, New York, NY 10003, (212) 929-6204.

Powerful and versatile video titler that uses GDOS fonts.

Hardware

JRI Genlock, John Russel Innovations, P.O. Box 5277, Pittsburg, CA 94565, (415) 458-9577.

Hardware device that lets you lay computer images over television images. (See the sidebar, "The Missing Link.") JRI's Genlock is available in the following incarnations:

JRI Genlock 520 External System, Call for price.

JRI Genlock 1040 External System, Call for price.

JRI Genlock Mega Internal Normal System, $650.

JRI Genlock Mega Internal High-Band System, $750.

JRI Genlock STE External System, Call for price.

Video Key, $99.95. Monitor Master, Practical Solutions, 1135 N. Jones Blvd., Tucson, AZ 85716, (602) 322-6100. Video Key converts RGB signals to VCR color format which means you can use your television as a computer monitor. Monitor Master includes a video jack so you can easily hook your late-model 1040ST to your television. It also lets you switch between a color and monochrome monitor with the simple push of a button.

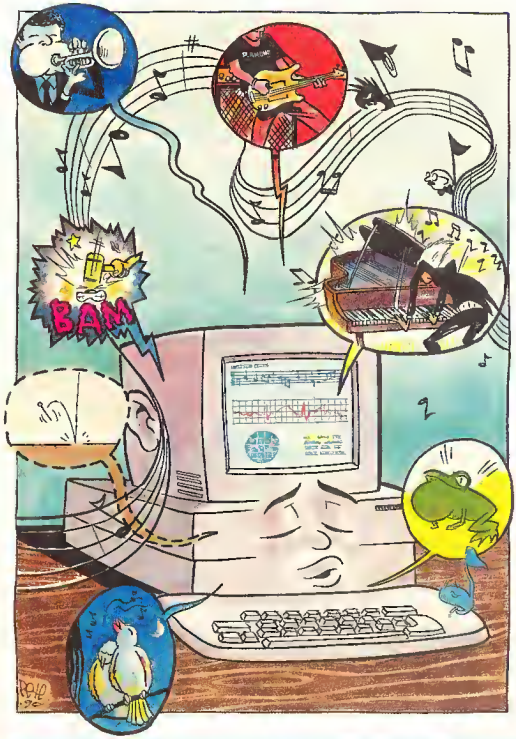
Video Wizard, $29.95 (plus shipping and handling). IntraCorp Inc., 14160 SW 139th Court, Miami, FL 33186, (305) 252-9040.

Hardware device that lets you link your ST with your VCR.

Vidi-ST, $149.95. Computer Games Plus, 1839 E. Chapman Ave., Orange, CA 92667, (714) 639-8189.

"Grabs" video images in real-time. John Nagy reviewed it in the May 1990 issue of START.

Soundtracks and Synchronization



Scoring Videos With Your Home MIDI Studio

BY RICHARD VIARD AND JIM PIERSON-PERRY

If you're like most musicians, you know that your art won't pay the rent. Until you're catapulted into fame and fortune, why not put your talent to work? Scoring for film and video is an effective compromise for musicians searching for ways to pay their bills while keeping the creative juices flowing. With an ST and MIDI and recording equipment, anyone can do the job at home.

Film scoring may seem like a lot of work, but you'll soon see how many short videos can be scored in just a few nights — and for a rather fair salary. Producers on shoestring music budgets look for low-cost, professional scoring. You'll find them (and your opportunity to advertise) at local television stations and cable companies, university film classes, advertising agencies and video production houses.

In A Nutshell

To get started, you must first decide on a service to offer and advertise. Creating a music score and dubbing sound effects are very different processes, although both require similar steps in preparing the final soundtrack. To offer either service, you need a sequencer that locks to SMPTE timecode (see the sidebar, "What is SMPTE?"), a SMPTE synch box to read/write timecode and a VCR with audio dub (to record sound independent of the video). Many professionals use 3/4-inch video tape that holds separate tracks for video, stereo audio and timecode. You can go far, however, with a 1/2-inch VHS tape (preferably with stereo audio tracks), and simply use one audio track for the SMPTE timecode. You will also need a monitor to view the video and assorted synth and sound-effects gear (i.e., reverb and echo).

You may need more equipment, depending on the project, such as a second VCR, a camcorder, a multitrack tape deck (if you're adding non-MIDI instrument sounds or voices) and a two-track tape deck for the final master (see *Figure 1*).

Hit Me With Your Best Spots

Initially, you'll meet with your client to run through the film. Keep in mind that producers are not musicians and may only have impressions and vague descriptions of the type of music they want. Try to give their suggestions feedback and propose your own ideas, expressing them in nontechnical terms. Suggesting instrument sounds for particular cues is a good way to start.

Your next meetings will be spotting sessions. You and your client should look for ways to divide the film into coherent subsections (cues). This is when you should list the video hits to musically highlight and what (if any) sound effects your client wants. Sound effects are easy to spot; music hits to correspond with screen actions are more subjective. These include such actions as changes in a character's facial expression, location changes, sudden actions, or characters entering or leaving a scene. Start a hit list for each cue, including hit names and the SMPTE times that they occur (see *Figure 2*). These hit lists will continually evolve and eventually serve as your bible.

Make sure the format of your video copy of the film matches the format of your VCR. Most production facilities copy film. Ideally, you want the SMPTE timecode with the frame rate and starting time striped onto an audio track. You also want SMPTE "burned in" (which puts a small window in each frame to hold the SMPTE time address) as a visual time reference. If you have a stereo VCR, copy any pre-existing dialog or sound from the film onto a second audio track. Otherwise, you'll need two video copies: one for dialogue and sound, the other for SMPTE.

If your video copy doesn't include timecode, you can use a second VCR to transfer the video signal as you stripe SMPTE onto the audio tracks. In this case, lead with about 20 seconds of tape so that your sequencer has time to synchronize. This timecode becomes the master timing signal for all your work. ▸

Back in your home studio, connect your VCR's audio output to your SMPTE box input, and find the SMPTE time for each music and sound effects cue. If a SMPTE window is burned into your film, use slow motion and pause/still on the VCR. Otherwise, pause the sequencer when you see the visual hit and note the readout from the computer's SMPTE display.

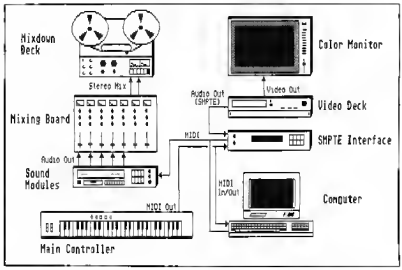


Figure 1: **A typical professional scoring system.**

The Creative Process

Now you can start composing music. A word of warning: Resist the inevitable temptation to turn on everything and play all the latest licks you've learned. Just relax, sit back and watch the film. Explore any feelings the film evokes and let musical ideas come to you. Question what role the music should play in the different cues. Can you use it to provoke sympathy for characters, foreshadow danger, emphasize action or serve as background source music (like a band playing in a bar)? Does it work to establish a sense of locality or time?

One approach is to create a theme that will develop throughout the film. If there are distinct parts to the film, create different themes for each part, integrating variations and mutations of the different themes in all parts. You can also create different themes for recurring characters, locations and ideas, or to bridge scenic transitions.

With SMPTE synchronization, you can literally compose and play in real-time as you watch the video. Try to find interesting textures, and experiment with tempos. Sometimes a subtle background texture is far more effective than a complex orchestration. Your music should complement and draw attention to the visuals, not overwhelm them.

Make sure your choice of instruments doesn't conflict with any pre-existing dialogue or sound effects. The editor can then mix your music pretty hot without overpowering the audio tracks. Otherwise, they may have to mix it painfully low, and you'll wonder why you spent so much time on subtle (now inaudible) nuances.

Now is the time to submit a midstream demo tape, which is usually just a cassette copy of your mix. The demo should be more finished than a rough cut, but still simple enough to let the client make suggestions. And be prepared to make changes, if not recreate the entire score.

Figure 2: **Each cue should have a hit list.**

```
Production by: R.Viard - SOUND FORCE PRODUCTIONS

Cue: C.O.A    Digital Equipment Corp.                Tempo: 86.088 (BPM)
For: Newbury Filmworks,  Peter Swanson            Frame Rate: 30
Date: 83/02/89                                  SMPTE Offset: 01:00:00.18

 #   SMPTE          Action              Bar  Beat  TmSig      Music
 =   =====          ======              ===  ====  =====      =====

 1 01:00:00:18 Title Screen              1- 1.000  4/ 4  Classical Piece Start
 2 01:00:06:00 Greenhouse shot           3- 1.122  4/ 4
 3 01:00:11:00 Voice Over                4- 4.289  4/ 4  Softer background
 4 01:00:38:00 Cut                      14- 2.989  4/ 4  Crescendo
 5 01:00:42:00 Voice Over               15- 4.722  4/ 4  Softer
 6 01:01:46:00 End                      38- 4.456  4/ 4  Out
 7 01:01:46:00 Desert Cue               38- 4.456  4/ 4  Desert Music
 8 01:02:03:00 Voice Over               44- 4.822  4/ 4
 9 01:03:30:00 Cut                      76- 1.522  4/ 4  Out
10 01:05:59:25 University Cue          129- 4.283  4/ 4  Concrete Music Starts
11 01:06:08:15 Voice Over              132- 4.706  4/ 4
12 01:06:12:15 Tower Shot              134- 2.439  4/ 4  Bass Drum Hit
```

And The Beat Goes On

If you've been watching the video while composing, your musical hits are probably matching the visuals pretty closely. Now it's time to tighten the match by adjusting the tempo and meter. If you find a single tempo to match all hits, you're a musical god; generally, however, you must vary the tempo and meter throughout your cues to get a close fit. How close is close enough? An audience can pick up mismatches of sound and sight hits by two or three frames. Figure about a tenth of a second for acceptable error tolerance.

In prehistoric days (just a few years ago), a combination of trial and error with click books and printed listings of times were the tools of the matching trade. Fortunately, there are several sophisticated public-domain programs and desk accessories today, such as TMONDY and SMPTECALC, which convert between SMPTE time and musical measures/beats. Some sequencers include a fit-time function, which automatically adjusts the length of a sequence to match a specified play time.

There are even programs designed to directly manipulate hit lists and seek optimum tempos for matching. ▶

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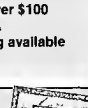

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At this writing, Hitman, from Dr. T's Music Software, is the only such program available for the ST/Mega.

Sometimes there's not enough time between hits for full measures at a certain meter and tempo. For example, a cue lasting 40 seconds at a tempo of 90 beats/minute would contain 61 beats, 15 full measures plus an orphan beat using a 4/4 meter. Using Hitman, you can insert a meter change for the last measure, with 14 measures of 4/4 and one measure of 5/4, then reset the meter to 4/4 at the cue end. You can save the tempo map as a standard MIDI file and import it into your sequencer as the conductor track. All pro-level Atari sequencers can read and write standard MIDI files.

Hitman is an elaborate and extremely useful program. Q-Factor, written for Hybrid Arts by the Pointer Sister's Greg Whelchel, is a similar program, scheduled for release later this year.

Crash, Bam, Vraam

As a film composer, you're not usually expected to create the sound-effects for the film. With today's inexpensive samplers, however, you might want to offer the service to producers.

You can import sound-effects MIDI files into your sequencer. The problem with sound effects, however, is that you need such a large library of them to do a decent job. Fortunately, a cottage industry has grown up that provides literally thousands of sound-effect samples on tape or CD, so you don't have to record them yourself.

Sometimes, a real-world sound is simply not convincing, and needs to be modified (i.e., a watermelon dropped from a second story window sounds more like a punch than a fist hitting flesh). These can be real challenges to your creativity. Try coming up with sounds for aliens, dinosaurs, light sabers or any other sound effects that you can't capture with a microphone!

Sound effects are easy to spot; music hits to correspond with screen actions are more subjective.

Final Mixdown

Now we're in the home stretch. The music is written, the tempos and visuals are wedded, any sound-effect MIDI triggers are in sequence and your client has approved your last demo. It's time for the final mixdown.

Producers commonly request a mixdown on a 1/4-inch, stereo tape deck at 15ips speed, with a mono mix on one track and SMPTE time-code on the other. Don't just copy the SMPTE signal from your video; reshape it as you stripe the mixdown tape track to prevent distortion.

Some clients may request a stereo mixdown on a 1/2-inch, four-track tape deck — decidedly pro-level equipment. Record your audio onto tracks 1 and 2, with the reshaped SMPTE timecode on track 4. Leave track 3 empty to prevent the SMPTE signal from bleeding into the stereo mix.

At the most basic level (i.e., scoring a home video), you can get by with two VCRs. Using the mixdown that is synched to the original video (the one containing a SMPTE timecode audio track), dub the video from the original along with the mixdown soundtrack (either mono or stereo) onto a second VCR tape. If you don't have adequate mixdown capabilities in your home studio, you might consider mixing at a local recording studio. Just bring your MIDI gear and (at about $300/hour) record everything direct-to-two-track — unless you're adding live (acoustic) tracks. Always back up your final mix!

Scoring Big

The amount of equipment you own is not as important as what you do with what you have. It's true that you need a basic studio, but if your equipment is in good condition, and properly set up, you can work quickly and efficiently. ■

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Richard Viard is a MIDI specialist at Dr. T's Music Software. He has also scored several training and industrial films and commercials for Lotus, Digital Agfa and Ford. Jim Pierson-Perry is a research chemist for Du Pont by day, the MIDI/Music Editor for START by night and a semi-professional musician when nobody's looking.

WHAT IS SMPTE?

Standardized by the Society of Motion Picture and Television Engineers, SMPTE timecode is a digital representation of a 24 hour clock, related specifically to tape frames. Each frame gets one SMPTE word, for an absolute time-address in terms of hours, minutes, frames and subframes. There are four SMPTE formats, arising from different film/video needs, that are specified by the number of video frames shown per second (fps): 24fps for normal film work, 25fps for European video, 30fps for North American monochrome video and 29.97fps (drop frame) for North American color video. Recording studios typically use the 30fps format. When using SMPTE, you must specify the frame rate and a starting time (often referred to as "offset"). Since SMPTE is a standard timecode, tapes created by one system may be read by another.

SMPTE works through a synch box, which reads the timecode signals from the tape and writes or translates them as musical beats (tempo), or a stream of MIDI-clock ticks. SMPTE timecode runs at a constant rate; however, every time you change the tempo (which is often in scoring work), the pace of the timing signal flowing into your sequencer must change.

Virtually every pro-level sequencer developer offers a companion dedicated- synch box. These work either through proprietary synch schemes or by translating the SMPTE code into a MIDI equivalent format, called MIDI Time Code (MTC). Either method lets you control tempo information from within your sequence; these methods provide an easy way to experiment with different tempo changes and let you work the music to fit the film. You can also use generic synch boxes, which require you to manually program tempo changes, and reprogram them with every change. Other types of synchronization, such as FSK or MIDI Song Position Pointer, are not accurate enough for video applications.

For our purposes, SMPTE is recorded on an audio or special video synch track. The process of recording the SMPTE timecode on a tape is called "striping," and is usually done prior to recording other tracks. Just pick a frame rate and offset, then have your sequencer or generic synch box send the signal to your recorder. As a safety measure, always stripe more tape than the project needs.

Noise, bleeding sound and just cheap tape can corrupt the SMPTE signal and cause "drop outs," spots where the timecode cannot be properly read. Most sequencers can handle short drop outs (one and two seconds) but longer ones can freeze your system. You can correct this by regenerating the timecode.

When copying tapes, reshape the SMPTE code (to avoid distortion). Reshaping means that your synch box listens to the original SMPTE track and writes a fresh duplicate. You'll need a timecode generator for regenerating or reshaping (you can rent one). SMPTETrack, from Hybrid Arts, is the only Atari-dedicated sequencer/synch box with reshaping (not regenerating) capabilities.

With your sequencer locked through SMPTE to a tape or video deck, you can start the tape at any point and the sequencer will know where it is supposed to begin playing. It can also "chase controllers," that is, it scans the MIDI sequence and sends any program changes or controller commands that would have occurred before the tape started (i.e., change synth patch or set volumes). The SMPTE time is usually shown somewhere on the sequencer screen, letting you note the timings as they correspond to video actions.

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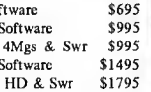

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BY GAVIN DOUGHTIE

PRIME CYBER

Meet Darrel Anderson, who illustrates the future.

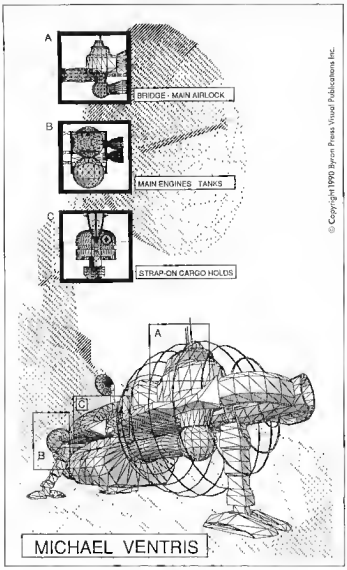
The mighty space station of Port Hesperus...insect-like Venus walkers...the crystal towers of Mars' Labyrinth City. These are the settings for Paul Preuss's bestselling Venus Prime series of science-fiction mysteries, based on the works of Arthur C. Clarke. They are also illustrations in the unique "infopaks" included in each book — illustrations created by artist Darrel Anderson on the Atari ST. Though he was inspired by the space program to pursue science and mathematics, in his last years of high school Darrel "went through a natural rebellion" and turned to art. Forming Everyman Studios with some of his classmates, among them noted Atari artist Richard Berry, Anderson explored all aspects of art and illustration before he began working with computers. In this interview he tells about his introduction to ►

computers and the details of creating the Venus Prime illustrations.

When did you first start working with computers?

I had seen computers and knew just from looking at them that if I ever got my hands on one I'd probably be hooked, but it didn't happen until around four or four and a half years ago. I had done some work for a guy named Byron Preiss, who packages books for a lot of major publishers. He contacted me about illustrating these interactive computer games, role-playing games. The first one was something called "Breaking Strain".

That was the title of the first Venus Prime book?



Right. That same material somehow came around to be the source for the Venus Prime series. Byron sent me an Atari 800, and that's what I did the game illustrations on. I immediately started fooling around with BASIC and wrote my own little additions to the painting software. I worked primarily with the Koala digitizing pad and whatever software came with that, and another horrible digitizing pad with a two-pivot arm. I think it was the worthlessness of that device that set me out to doing some of my own programming to try to create these images. Anyway, I worked on that project and got a big kick out of it, but I could see right away that I wanted more resolution and color. It was exactly at this point that the ST was being introduced. I bought my ST before it showed up in the shops.

Sticking With Atari

So it was a natural Atari progression?

Yeah. At that point for anybody like me the obvious choice was the ST or the Amiga, but the Amiga cost about twice as much. That was a pivotal factor for me (laughter), so I went ahead and bought the Atari.

Did you start off working with NEOchrome?

I played with what was available, mostly NEOchrome.

Shortly after I bought the ST I went out to Boston to spend some time with Richard Berry, and talked him into buying one as well. That was about the time DEGAS came out. I was in Boston when I started working with the first version of DEGAS on that image that won the Antic competition (July 1986 issue of Antic).

The Stone Face?

Right. I got back home just in time to get the machine up and running, because I'd taken it to Boston, put the finishing touches on the image and Federal Express it to Antic at the last possible second. As a result of that, two guys at Antic, Gary Yost and Jack Powell, called me up. First Jack got in touch with me about doing an article (Winter 1986 and Spring 1987 issues of START), and the same day Gary called and said "I don't care what Jack has told you but we've got this CAD-3D product coming out, we need some objects for it and this is first priority for you, Darrel." Gary was staking his claim on my time right from the start.

That was the Future Design Disk?

Right.

There wasn't anything like 3D clip art for other computers at the time, was there?

I think we may have started something, because it's happening everywhere now.

How did the Venus Prime project get to you?

That's the same guy, Byron Preiss, packaging. He has a history of bringing graphics into fiction. He was one of the originators of the graphic novel. He did something with the comic artist Jim Steranko in the early seventies. They were paperback format, but comic books. Recently, Byron packaged two books, *The Planets* and *The Universe*. They're hardcover collections of essays, short stories and illustrations.

Do they include any of your illustrations?

I have an illustration in the *Universe* book, an oil painting. Another book in the series called *Microverse* has one of my computer illustrations done on the Mac.

Are you going to be doing any computer illustrations for other books?

Richard Berry and I are doing a book strictly of computer art and illustration that will be published by Grant Books in 1990.

Darrel Anderson by Darrel Anderson

The Venus Prime Process

What's the process for creating the Venus Prime illustrations?

As luck would have it, I've known Paul Preuss (the author of the series) for a number of years, long before this project came up. He's a fine author and has several novels of his own out there. What happens is at some point, usually long before the work is even written, he and I will get on the phone and I'll draw out what nifty gadgets may be available to him in the story. He's got a real sharp technical mind, a good mind for the details of how these things should actually function in an acidic environment or whatever it may be. He does a lot of research. I'll throw some sketches at him, and he'll throw some ideas back at me. This goes all the way back to the Everyman Studio. That's how we all learned, because we didn't have higher education. We were intense collaborators. We would literally hand the same canvas or piece of paper back and forth. It comes very naturally to us.

As the Venus Prime series progresses, the illustrations get technically more sophisticated. Were you using Cyber Control to create the objects for the design disks ►

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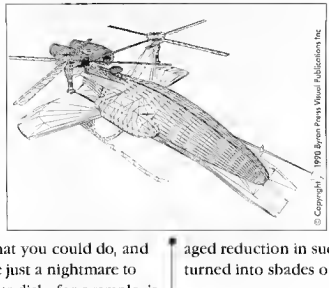
and the Venus Prime books?

Absolutely. The object design and creation aspect of Cyber Control, which in some ways was its weakest or most difficult capability, was what really fascinated me. I wanted to develop my own object-building tools. This was all pre-Cyber Sculpt. CAD-3D was pretty limited in what you could do, and of course the join functions were just a nightmare to sculpt objects with. The Microbots disk, for example, is almost entirely my object-creation tools written in Cyber Control. As I developed the tools, usually at some point one of those books would come up.



In the third book there are illustrations with smooth-shading and shadows. What were those rendered on?

This gets into what I think is probably a fairly unique setup. I'm working with an ST/Mac II hybrid system, though it was slightly different at the point I did that book. I wrote my own little rendering package on the ST which did what GDOS was supposed to do for me but never worked, and that is produce resolution-independent, or very high-resolution, object-oriented bitmaps. I was creating these oversize bitmaps on the order of 1200 x 1200 pixels on the Atari, then moving those files over to the Mac and doing a pixel-averaged reduction in such a way that the dither pattern was turned into shades of gray. It's all my own software.

Are you going to sell any of these programs?

Right now I'm working on a paint program on the Mac which will probably be my first venture into commercial software. The stuff on the Atari — I was tempted for a while there but it all operated in a bizarre way, and I don't know if I'll ever have the time or energy to make it more acceptable. In essence it required having a monochrome monitor. The large bitmaps were actually created in chunks. The program creates nine panels and moves them to an area of

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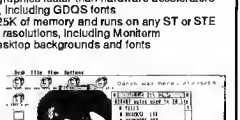

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memory one at a time. It was kind of slow and kludgy. What I do at this point on the Atari is simply save what is the equivalent of an object-oriented PICT file on the Mac — in other words, simply a series of commands to draw a triangular shape, filled or outlined or opaque or transparent. Then I render everything on the Mac so I can go straight to grayscale. This little package I wrote on the ST does simple shading much like CAD-3D does, but I can go ahead and generate the 256 gray level shading that the Mac is capahle of rendering.

I bought my ST before it showed up in the shops.

Have you been working this way since the first Venus Prime book?

No. That started with the third one.

The first two were just laser printed from the Atari?

They weren't even laser printed, they were printed with a 24-pin dot matrix. That really does nice work with one of those multi-strike ribbons, like a carbon ribbon for a typewriter. In some ways you can get better-than-laser-printer results.

How have computers influenced your work in general?

CAD-3D is very powerful, especially for a project like book illustrations. You may be doing a number of illustrations that are in the same setting, build the scene only once, and then look at it from anywhere you like. I illustrated a Ray Bradbury story which centers around a kid in his room, so I built the room in CAD-3D and used it as a basic map. It brought me to some unusual camera angles.

Do you have any advice for ST illustrators?

Just get in there and start scribbling and playing and see what it gives you naturally. That is the advice I would give to anyhody in any media. ■

Gavin Doughtie writes and directs for CU Productions in Hollywood, Calif.

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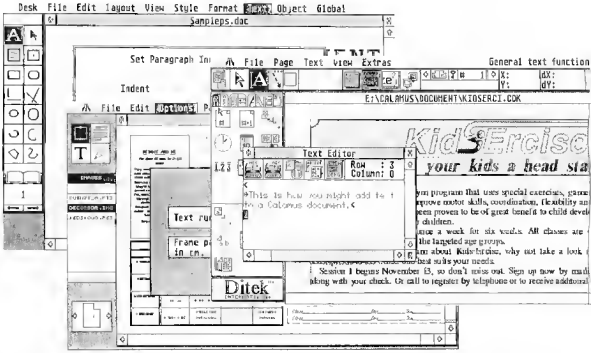
DESKTOP PUBLISHING: AN INTRODUCTION

BY DAN FRUCHEY, START WORD PROCESSING / DESKTOP PUBLISHING EDITOR



Since its introduction five years ago, desktop publishing has become the third most popular application for which a home computer is used (preceded only by word processing and databases). One industry source claims 40 percent of all personal computer users own DTP software (pirated copies of the software probably make that figure much higher). With current popularity and market growth that suggests a promising future, DTP will continue to play an important role in the way we use computers.

What is Desktop Publishing?

Desktop publishing is still a new concept and most sources only provide a rough definition of its purpose. It's not hard to understand the confusion. Desktop publishing employs terminology and concepts familiar to publishers and computer users alike, but it combines them in a new way. The result is a hybrid that is difficult to classify. Think about it. Before reading further, can you provide a coherent description of DTP that won't leave a layman floundering in confusion?

How about this: Desktop publishing is an integration of computer and publishing technologies that lets you produce high quality documents quickly and easily at a fraction of the cost normally charged by most commercial services.

This definition can be expanded upon greatly, but it simply states the case. Desktop publishing encompasses most types of hardware and software. It's not, as some individuals seem to think, simply a page-layout program used to design and print pages. DTP systems use a variety of software including word processors, draw-and-paint programs, CAD packages and page-layout programs. It combines computer hardware to increase its power and versatility, including scanners, high-resolution monitors, hard disks, laser printers and more.

Why Desktop Publishing?

There are many reasons that DTP systems have flourished in the last five years. Some of the primary reasons users embrace DTP include:

Cost Effectiveness: When you break down the per-page cost you'll find that DTP is extremely inexpensive when compared with other options. Many commercial publications use DTP systems to produce preview copies of documents for examination by writers and editors.

One large publishing house noted a savings of $200,000 annually when they began employing DTP systems in-house. One person can produce quality documents without the assistance of layout specialists and other technical staff, thereby saving money on salaries, office space, etc.

Faster Production and Timeliness: Creating documents by yourself can dramatically decrease production time. Instead of waiting hours for a backlogged printing house to produce a report or sales presentation, you can print it yourself. When you can create page layouts yourself, you spend less time telling a printer what you want, it reduces foot work and lets you make last-minute changes without returning to the print shop.

START magazine is now produced on an Atari DTP system. It helps reduce our lead time by about a month, making issues more timely than before. Likewise, a DTP system will help businesses produce documents that meet the needs of clients in a more relevant manner. Instead of pencilling in data on a brochure because the old copy is outdated, you can quickly print a new version with your changes. When a customer wants revisions in a layout, a few minutes of work will let them see an actual copy of what will be printed.

Quality: Documents you produce with a word processor generally rely on a printer's built-in font set or a limited range of fonts included with the software. Page-layout programs include a wider range of fonts in a variety of sizes and styles that word processors can't access. Graphics can be imported, lines and boxes can be added and each component can be precisely placed without the telltale signs of cut and paste. DTP systems *produce* camera-ready copy that is identical to the final version which means, no more mockups to approximate the finished product.

Control: When a document is finished it looks exactly the way you want it to, not the way a layout artist or editor thought you wanted it. From the size of the headline to the font style and line width used, DTP lets you display your message in exactly the format you want. If the printout is inadequate, you can make some quick changes and print it again.

Satisfaction: Doing it yourself can be enjoyable. It is a creative form of self expression that can be used for virtually any type of document. DTP requires a little patience but the results are quite pleasing. I actually find that DTP is fun (unless I'm approaching a deadline) and the compliments I get on the catalogs and manuals I produce are quite satisfying.

Desktop publishing is the third most popular computer application.

Who Uses Desktop Publishing?

Small businesses have embraced the technology more firmly than any other group. Many businesses that can't afford to patronize a print shop can still add DTP capabilities to their existing computer system at a reasonable price.

Educators are avid fans of DTP as the quality documents they produce can be directed to a specific group of students and help improve grades and increase comprehension.

Home computer users desire DTP systems to produce documents such as garage sale flyers, school reports and church bulletins. Documents are more likely to be read when they are carefully prepared with a variety of fonts and graphics.

The general public frequently uses DTP services. Dataquest, a marketing research firm, reports that the demand for these services has risen from $2.5 million in annual sales in 1985 to an estimated $5 billion in annual sales in 1990. The growth in this field is staggering as people realize the savings and potential benefits of DTP.

Desktop Publishing Systems

Once you've made the decision to go DTP, consider the various systems based on quality, support, service and price.

One of the fastest, most versatile and professional DTP systems available bears the Fuji symbol. It runs the same 68000 microprocessor used by the Macintosh and, unlike the IBM, it can perform DTP without adding on special cards or interpretive software. Best of all, an entry-level system costs under $2,000.

In the ST, Atari has produced a machine that was made for DTP. It's fast, easy to use, flexible and on a system that includes a laser printer, pages come flying out in as little as 30 seconds. The ST is a DTP workhorse that outshines the competition at a fraction of the price.

The Survey Says...

In the START Reader's Survey conducted in the May 1990 issue, we received many requests for more coverage of DTP. It seems that many of us have the same idea and are using our ST DTP systems to their utmost. Beginning with this issue we'll cover Atari DTP from start to finish – every month. We'll also discuss the latest in word processors and even throw in a hint or two on how to use them more efficiently.

Next month we'll discuss DTP system configurations and software. ■

Word Processing/Desktop Publishing Editor Dan Fruchey is a paramedic, computer junkie and sometimes writer who runs his own DTP business on the side.

GALACTIC MERCHANT

Beginning in the late 20th century, the world fell into the grip of a severe economic depression that lasted a hundred years. But the perfection of space travel in the latter part of the 21st century spawned a new breed of capitalist poised like a hungry tiger to pounce on the emerging interplanetary trade boom. These "galactic merchants" are now the watchdogs of the airwaves, listening for buy-low, sell-high options, and are renowned for braving interstellar pirates and meteor showers — anything to get a good deal! Now's your chance to join in all the fun.

BY MARK BUTLER

When you heard the news that Venutian merchants were paying top dollar for back issues of START magazine, you mortgaged your ship and packed it with the goods. Now you find yourself hurling through hyperspace in your galactic freighter, fueled mostly by the dollar signs that race in your mind. By your calculations, if you make it to Venus before your competitors, a handsome profit will be yours. If not, you lose everything. Suddenly, the alarm sounds — pirates! The automatic defenses warm up, ready for the unavoidable — and time-consuming — melee. Maybe you can wipe these guys out and still make it to Venus with plenty of time for lunch. Maybe. Welcome to world of Galactic Merchant.

Are You Game?

If you think you're ready to play, double-click on the archive file GALMERCH.PRG and choose Extract when the dialog box appears. Select a destination disk and the files will un-ARC directly onto that disk. Make ►

GEORGE RIEMANN

AT A GLANCE

Program:	Galactic Merchant
Type:	Game
Requirements:	512K, low rez
Arcfile:	GALMERCH.PRG
Files:	MERCHANT.PRG
	SHIP.PI1
Language:	GFA BASIC 3.0

sure that SHIP.PI1 and MERCHANT.PRG are in the same folder. To start the program, double-click on MERCHANT.PRG.

After a few moments, the title screen will appear with five options. Click on INFORMATION ABOUT HOW TO PLAY for a brief description of game mechanics. INFORMATION ABOUT GAME LOGIC discusses how the game calculates values and gives you a few tips on strategy. Choose either the EASY or HARD level. Click on START GAME to begin to trade.

Tools Of The Trade

You start the game with your ship in orbit. On the screen is your control panel. The large window in the center of the panel displays a map, radio announcements and various economic data as you call for it. The small buttons along the sides of the window describe your view: ALPHA, MAP, VIEW, SHIP and TACT.

Above the window are two rectangular boxes. The left box displays your account balance in the galactic bank. The numbers glow red if you fall into debt. The right box details your ship loan, the amount you owe and the number of months until your next payment is due. Late payments result in service charges. If you get too far behind, your ship can be repossessed.

Along the bottom is the console with buttons that are readable only when their functions are executable. A message box sits above the buttons.

The buttons are:

TAKE OFF: This button engages the computer-controlled take-off sequence. Just sit back and enjoy. You can only take off from a planetary surface, which you can see through the large window. After lift-off you will be in orbit around the planet.

LAND: This button engages the computer-assisted landing sequence. A tactical display to the right of the window depicts your descent. The large window displays an aiming box. If the planet has a starbase, it will land your ship automatically with its homing signal. If there is no starbase or you have a damaged computer console, an auxiliary door opens in the window. It has four arrow keys; you must use them to keep the aiming box inside the safe zone.

If you make it to Venus before your competitors, a handsome profit will be yours.

BUY: You can buy merchandise from any planet. Click on BUY and the large window displays all their stock available. To buy an item, simply click on it with the left mouse button. Then decide in which of your ship's four cargo bays to store it. If the bay is green, you can store cargo in it.

SELL: You may also sell merchandise to any planet that wants it. Click on SELL and the large window displays your four storage bays, with their contents. It also displays your purchase price and what the planet will pay for them. On the Easy level it displays the percentage of your profit. To sell an item, click on it with the left mouse button. The storage bay is automatically unloaded and your bank balance increased. If the planet doesn't want your wares, the item will be followed by a series of dashes.

COMPUTER: Your ship's computer has several useful functions. The Easy level presents you with a selection screen.

RADIO: Click on RADIO to read excerpts of news items. These inform you of significant changes in the production or consumption of planetary merchandise and keep you aware of the best interstellar deals. This button glows red when the news changes.

WARP: WARP speed is functional only after you're in orbit. The large window displays a galactic map. The planet you are currently orbiting is highlighted in red; any planets mentioned in current radio broadcasts are in yellow. Left-click to warp to a planet, or right-click on the planet to get information about it. On the Easy level, you get a complete description of all the planet's imports and exports, as well as whether or not it hosts a starbase. On the Hard level, or if your computer console is damaged, you only get the planet's name. If the planet has a starbase, the name is yellow; if it doesn't, the name is red.

The green dashed circle centered around your ship represents the distance you can travel on your fuel. The radius depends on the game level, the status of the engines and your fuel level. You can order your ship to travel past your fuel limit though this is not recommended. Purchase fuel at any starbase.

DEFEND: This button is not available to you. The computer console automatically engages a defense when danger occurs during hyperspace transit. There are two dangers: meteor showers and pirate raiders.

There isn't much you can do in a meteor shower; the ship's relative speed is too fast for human reactions. The computer console connects your ship's sensors to shields and

drives and tries to avoid everything. All you can do is hold on!

Your ship's sensors can detect distant pirate ships, however. The large window depicts a tactical display, with your laser's energy level on the right and the enemy ship and aiming box in the center. Try to aim your shot with the box, moving it over the pirate and firing with the left mouse button. Driving pirates away requires several successful hits. If you can't make them leave, they will hoard your ship and steal all your cargo. And you better have cargo; if you don't have any booty, they'll probably destroy your ship.

STATUS: The STATUS button gives you a schematic display of your ship. Green, yellow and red boxes outline each significant area of your ship. Green means the area is functional; yellow means it's damaged and red means the area is completely destroyed. The STATUS button turns red when changes occur.

STARBASE: On the surface of a planet, you can try connecting with the local starbase. If the starbase answers, your options are listed in the large window. You can purchase fuel, order robots to repair your ship, and make electronic payments. On the Hard level, you can also upgrade parts of your ship.

Galactic Economics

There are 20 planets in Galactic Merchant. Each planet is a major or minor exporter or importer of goods in 10 categories. When an exporter increases production, the price drops. The reduction is based on the average price of the product on all planets. When an exporter decreases production, the price of the product inflates. When an importer increases demand of a product, the price increases and with a reduction of demand, the price plummets.

Interstellar Trading Tips

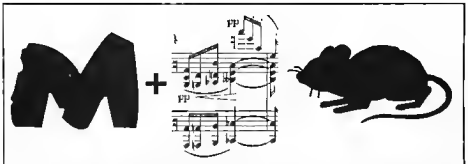
Watch the airwaves. Buy merchandise during a massive increase in production; it could mean discounts. For the big money, sell during an increase in demand.

Watch your fuel level. Many merchants have discovered only too late that none of the planets in their small, green, fuel circle has a starbase on it.

Avoid pirates and meteor showers and remember: the customer is always right.

Good luck.

Mark Butler is a Computer Systems Specialist at Chevron in Richmond, Calif. This is his first program for START.



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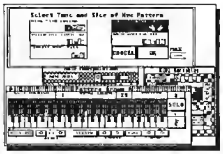

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DESIGNING PROGRAMS

Five CAD Packages Compared

BY MARIO PERDUE

As a computer-aided design professional, I have always been intrigued with what is available on microcomputers for use in the CAD/CAM arena. Some quite excellent programs are already on the ST, five in fact. In the following comparison, we'll take a look at these packages and see how well they compare to the high-end systems that I am familiar with.

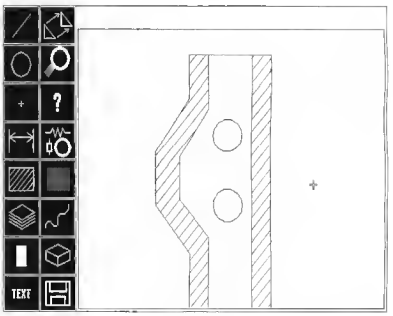
My background includes 12-plus years in the CAD/CAM industry, working mostly with Computervision minicomputers and workstations. This experience has certainly affected my perception of what a CAD system must have to be considered a professional design tool. To be a complete package, a CAD system has to be packed full of features, the interface must be intuitive and easy to use and above all, it must be fast.

This comparison is in two parts. Part 1 provides a short description and my overall impression of each program. Part 2 is a series of comparison charts, the result of very rigorous testing.

Athena II Version 2.0

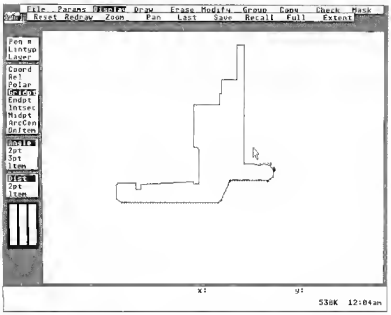
Athena is probably the oldest CAD package on the ST. The package I tested was a beta of version 2.0. Unfortunately, a manual did not accompany the program, so I had to rely on my own resources to find a solution anytime something appeared to be missing.

Athena



Fortunately, the program is very easy to learn. Athena's user interface is reminiscent of a paint program. You're presented with a series of icons along the left side of the screen which select the major functions. Once a function is selected — lines for instance — a submenu pops up in the center of the screen that lets you set the specifics of the command. Since this type of interface is common to many GEM applications, ST users will feel at home with it. However, when working in a drafting environment, I find this to be slightly annoying. I prefer to have the graphics I am working on visible at all times. Having my design obscured periodically tends to break my concentration.

There were many capabilities that I feel are necessary for professional drafting which are not available in Athena. For this reason, I would not recommend it for drafting. It may be a good choice for engineering sketches, especially if the bugs can be worked out of the DXF converter. Having DXF would let you take an engineer's drawing and import it into a more full-fea-



Drafix

tured drafting package. Athena II, however, is a good choice for home use, or if you have limited drafting needs and/or a tight budget.

BeckerCAD ST

BeckerCAD is a German import. It has a reasonable collection of features and performed well in the timing tests, placing second in overall speed. Ahacus has done a competent job translating the manual into American (as opposed to English, which isn't always the same thing). It is well written and does what it's supposed to do; it tells you how to use the program.

BeckerCAD is the only package to come with supporting libraries, including electronic schematic, hydraulic/pneumatic and architectural applications. If your design needs are in one of these areas, a large amount of the groundwork has already been done for you.

There is nothing about BeckerCAD that I found difficult to use. The user interface is easy to learn. It won't take you long to draw that room addition or that model rocket you've been wanting to build for the last several months. For most personal and even some small-business uses BeckerCAD will suffice.

CADjA

This program is so new (in this country) that it almost didn't make it into this comparison. The copy I evaluated was a partially-disabled demo version. Features and performance place it in the same category as Drafix and BeckerCAD.

The user interface is somewhat like DEGAS in that the command menu fills the entire screen and is toggled with the right mouse button. As with Athena, I found this to be annoying. However, the icons are fairly well-designed and their arrangement on the screen is somewhat logical.

Some commands and modifiers are available only through keyboard entry. This includes things like snapping to the end point or midpoint of a line. Again, I found this to be irritating. I think it would be better to support these functions with menus and have keyboard equivalents. Fortunately the choice of keystroke normally makes sense (for instance 'E' snaps to the end of an entity).

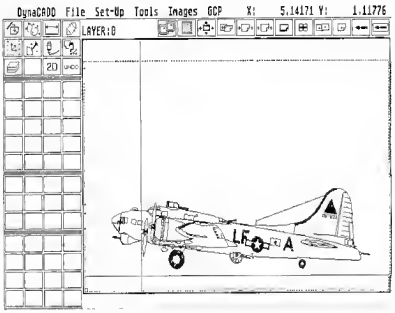
I didn't encounter any problems with CADjA in the short time that I used it. It seems to be a fairly solid, bug-free product. Once the manual is completed, this program will be a strong contender in the mid-priced CAD arena.

Drafix

One of the better programs of the bunch, Drafix has capabilities second only to DynaCADD. The documentation is very complete and well organized and libraries are available (for a fee) to support many different applications.

Drafix was ported from the IBM and as such does not use the standard GEM interface. However, the interface is easy to use so this doesn't cause any real problem. The only irritant is that it is assumed that you use a three-button mouse. The right button serves as the middle button and both buttons as the right button (the left button is, of course, the left button).

Overall, Drafix is an excellent package for home and small-business. Unfortunately, Foresight has decided to publish no further upgrades or enhancements. ►



DynaCADD

DynaCADD

DynaCADD is, without a doubt, the best CAD program on the ST. It is also the best CAD program that I have seen running on any microcomputer. It comes closer to having all the features of a major CADDS package than any other PC-based system I have ever used. And it's fast. In many cases, faster than CADDS 4X, a very high-end drafting machine.

DynaCADD supports both 2D and 3D entity types, the only ST program to do so. This makes it possible to look at a part from any angle to help visualize its shape. Four different views of a 3D model can be displayed on the screen at any given time. These views can be mixed with 2D graphics for dimensioning, etc.

The documentation supplied with DynaCADD is excellent. It includes both a 2D and 3D tutorial and a complete command reference. Each command includes a clear example of how it is used from the icon interface as well as from the command line.

DynaCADD is the only CAD program that I would not hesitate to recommend for professional use (it's a bit expensive for home use). I have used it in a production environment on 3D applications and it performed beyond my expectations.

About the Comparison Charts

Table 1 is a comparison of the major features of each of the programs.

Table 2 shows the results of the timing tests. The Part used in these comparisons consisted of 3,744 2D entities (including 3,328 lines and 416 circles).

All ST software was run on a Mega 2 (.5 MIPS) with a monochrome monitor, math coprocessor and 40MB hard disk. The tests on CADDS 4X were run on a Sun Microsystems 3/160 (2 MIPS) workstation with 16MB RAM, a 19-inch color monitor, graphics accelerator, FPU, math coprocessor and two 515MB hard disks. ■

This is Mario Perdue's first appearance in START.

Products Mentioned

Athena II Version 2.0, $149.95. Iliad Software Inc., 1470 S. State St., Orem, UT 84058, (801)226-3270.

BeckerCAD ST, $95. Abacus, 5370 52nd St. SE, Grand Rapids, MI 49512, (616)698-0330.

CADjA, Call for price. Rio/Datel Computers, 3430 E. Tropicana Ave. #67, Las Vegas, NV 89121, (800)782–9110.

Drafix, $195. Foresight Resources Corp., 10725 Ambassador Drive, Kansas City, MO 64153, (800)231-8574.

DynaCADD, $995. ISD Marketing Inc., 2651 John St., Unit 3, Markham, Ontario L3R 2W5, Canada, (416)479-1880.

PROGRAM FEATURES

	Athena	BeckerCAD	CADjA	Drafix	DynaCADD	CADDS 4X
Retail	$149	$95	Call	$195	$995	$20,000+
Insertable Entity Types						
LINEAR						
Points	Y	Y	Y	Y	Y	Y
Lines	Y	Y	Y	Y	Y	Y
Chamfers	N	N	Y	Y	N	Y
Rectangles	Y	Y	Y	Y	Y	Y
Polygons	N	Y	Y	Y	Y	Y
Strings	N	Y	N	Y	N	Y
CURVES						
Circles	Y	Y	Y	Y	Y	Y
Arcs	Y	Y	Y	Y	Y	Y
Fillets	Y	Y	Y	N	Y	Y
Ellipses	Y	Y	Y	Y	Y	Y
Elliptical Arcs	Y	Y	N	N	Y	Y
Hyperbolas	N	N	N	N	N	Y
Parabolas	N	N	N	N	N	Y
Splines	N	N	N	Y	N	Y
B-Splines	Y	N	N	N	Y	Y
Bezier Curves	N	N	N	N	Y	N
Nurbs	N	N	N	N	N	Y
DIMENSIONING						
ANSI Standard	?	N	N	Y	Y	Y
DIN Standard	?	Y	Y	N	N	Y
JIS/ISO Standard	?	N	N	N	N	Y
Linear	Y	Y	Y	Y	Y	Y
Ordinate	N	N	N	Y	N	Y
Radius	Y	Y	Y	Y	Y	Y
Diameter	Y	Y	Y	Y	Y	Y
Angular	Y	Y	Y	Y	Y	Y
Feature Control Symbols	N	N	N	N	N	Y
Datums	N	N	N	N	N	Y
Labels	Y	N	Y	N	Y	Y
Detail Balloons	N	N	N	N	N	Y
TEXT						
Text Font Editor	N	Y	N	N	Y	N
DTP Fonts	N	N	N	N	Y	N
User Selected Fonts	N	Y	N	Y	Y	Y
User Selected Height	Y	Y	Y	Y	Y	Y
User Selected Width	N	N	N	Y	Y	Y
User Selected Angle	N	Y	Y	Y	Y	Y
User Selected Slant	N	N	N	Y	Y	Y
Text Justification	N	N	N	Y	Y	Y
True Character Kerning	N	N	N	N	Y	N
Proportional Spacing	N	Y	N	N	Y	Y
Constant Spacing	Y	Y	Y	Y	Y	Y
OTHER						
2D-Solid	Y	N	N	Y	Y	Y
Figures	Y	Y	Y	Y	Y	Y
Subfigures	N	N	N	Y	Y	Y
Cross Hatch	N	Y	Y	Y	Y	Y
Pattern Hatch	Y	Y	N	Y	Y	Y
Centerlines	Y	N	N	Y	Y	Y
LOCATION & ENTITY SNAP						
Mouse Location	Y	Y	Y	Y	Y	Y
Absolute	Y	N	Y	Y	Y	Y
Incremental	N	N	Y	Y	Y	Y
Relative	N	N	N	Y	N	Y
End	Y	N	Y	Y	Y	Y
On	Y	N	Y	Y	Y	Y
Origin	Y	N	N	Y	Y	Y

	Athena	BeckerCAD	CADjA	Drafix	DynaCADD	CADDS 4X
Intersection	Y	N	Y	N	Y	Y
Parallel To	Y	N	Y	Y	Y	Y
Perpendicular To	Y	Y	Y	Y	Y	Y
Tangent To	Y	Y	Y	Y	Y	Y
ENTITY SELECTION						
Single Entity	Y	Y	Y	Y	Y	Y
All Entities	N	N	N	Y	Y	N
Inside Window	N	Y	Y	Y	Y	Y
Outside Windaw	N	N	N	Y	Y	Y
Inside Paly Windaw	N	N	N	N	Y	Y
Outside Paly Windaw	N	N	N	N	N	Y
Last Entity	N	N	N	N	Y	N
By Layer	N	N	Y	Y	Y	Y
By Calar/Pen Number	N	N	N	Y	Y	N
By Style Or Weight	N	N	N	N	Y	N
By Chaining Entities	N	N	N	N	Y	Y
By Type	N	N	N	Y	Y	Y
ENTITY & DRAWING INFO						
Measure Distances	N	Y	Y	Y	Y	Y
Measure Angles	N	Y	Y	Y	Y	Y
Measure Perimeters	N	N	N	N	Y	Y
Measure Areas	N	N	N	N	Y	Y
VERIFY						
Location	Y	N	Y	Y	Y	Y
Style	Y	N	N	Y	Y	Y
Slant	N	N	N	Y	Y	Y
Ratatian	N	N	N	Y	Y	Y
Extents	N	N	N	Y	Y	Y
Drawing Parameters	Y	N	Y	Y	Y	Y
ENTITY TRANSFORMATION						
Mave	Y	Y	Y	Y	Y	Y
Copy	Y	Y	Y	Y	Y	Y
Delete	Y	Y	Y	Y	Y	Y
Mirrar	Y	Y	Y	Y	Y	Y
Stretch	N	N	Y	Y	Y	Y
Scale	Y	N	Y	Y	Y	Y
Ratate	Y	Y	Y	Y	Y	Y
Blank	N	N	N	Y	Y	Y
Unblank	N	N	N	Y	Y	Y
Trim Ta Lacatian	N	N	Y	Y	Y	Y
Trim Ta Carner	N	Y	Y	Y	Y	Y
Trim Ta Intersectian	Y	Y	Y	Y	Y	Y
Trim Multiple	N	N	N	N	Y	Y
Divide At Lacatian	Y	Y	Y	Y	Y	Y
Divide Na. af Times	N	N	Y	N	Y	Y
Revalve	N	N	N	N	Y	Y
Sweep	N	N	N	N	Y	Y

	Athena	BeckerCAD	CADjA	Drafix	DynaCADD	CADDS 4X
Graup	N	Y	N	Y	Y	Y
Offset	N	N	N	Y	Y	Y
Add Draft	N	N	N	N	N	N
Add Shrinkage	N	N	N	N	N	N
Remave Shrinkage	N	N	N	N	N	N
Map 3D Ta 2D	N/A	N/A	N/A	N/A	Y	N
PLOTTER SUPPORT						
HPGL	N	Y	Y	N	Y	Y
DMPL	N	N	N	N	Y	Y
Custam Drivers	N	N	N	N	Y	Y
Scaled Plats	N	N	Y	Y	Y	Y
Plat Ta Disk File	N	N	N	N	Y	N
Background Platting	N	N	N	N	Y	Y
Plat Ta Fit Device	N	Y	N	Y	Y	Y
PRINTER SUPPORT						
Epsan 9-Pin	Y	Y	Y	Y	Y	Y
Epsan 24-Pin	Y	Y	Y	Y	N	N
Laser Printer	Y	Y	Y	Y	Y	N
Postscript Campatible	N	Y	N	N	Y	N
Encapsulated Postscript	N	N	N	N	Y	N
FILE FORMATS						
DXF	Y	N	N	N	Y	N
ASCII	Y	N	Y	Y	Y	N
IGES	N	N	N	N	N	Y
PDES	N	N	N	N	N	Y
LINE WEIGHTS/STYLES						
User Widths	Y	N	N	N	N	Y
User Styles	N	N	N	N	Y	Y
GRID						
User Selectable Grid	Y	Y	Y	Y	Y	Y
Grid On, Na Snap	Y	N	Y	Y	N	Y
Grid On, With Snap	Y	Y	Y	Y	Y	Y
COLOR SELECTION						
Calar By Layer	Y	N	N	N	Y	Y
Color By Type	N	N	N	N	Y	Y
Calar By Entity	N	N	N	Y	Y	Y
MISCELLANEOUS						
Plotter Driver Editar	N	N	N	N	Y	Y
Math Capracessar Suppart	N	N	N	N	Y	Y
Graphics Acceleratar	N	N	N	N	N	Y

Notes 1. Na acceleratar exists far the ST. 2. DynaCADD supparts calar, but requires aptianal high-resalutian calar manitar.

TEST-PART RESULTS

	Athena	BeckerCAD	CADjA	Drafix	DynaCADD	CADDS 4X
File Size	303344	191919	--[1]	100015	280006	414720
Time ta Activate Part	1:43.00	0:37.85	--[1]	0:59.71	0:28.29	0:24.51
Time ta Repaint Screen	1:29.95	0:27.21	0:40.56	0:31.64	0:09.77	0:06.74
Time ta Regenerate Part	N/A	N/A	N/A	N/A	0:09.92	1:09.20
Mave Graup af Entities	--[2]	0:24.11	0:30.64	0:49.48	0:10.72	1:49.24
Capy Graup af Entities	--[2]	0:20.15	0:22.61	0:30.59	0:10.73	2:10.50
Ratate Graup af Entities	--[2]	0:03.20	0:08.52	0:08.29	0:02.55	0:12.06

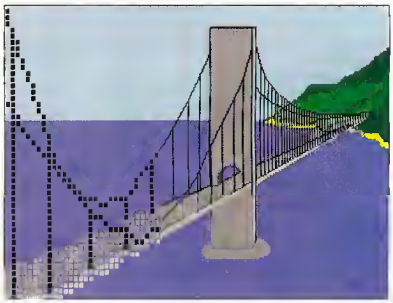
Notes 1. CADjA was pravided in a demo versian anly. The functions necessary far this test were disabled. 2. Athena was nat able to select by windaw, which made entity selectian taa time cansuming ta include in this camparisan.

PIXELS AND BYTES

Basic ST Graphics

BY ANDREW REESE, START GRAPHICS EDITOR

When the computing world first saw Atari's ST in 1985, most commentators were delighted to see such graphics power in a reasonably priced machine. Now, five years later, ST graphics are still quite acceptable; indeed, except for hardcore graphics junkies, ST owners are happy with what the little gray box can do. In this column in the months to come, we're going to take a look at the graphics that made the ST so popular – what they are, how to use them and what's coming.



The left side of the Golden Gate Bridge has been distorted to demonstrate the difference in smoothness due to resolution.

We're going to begin with a review of some basic computer-graphics principles and how the ST handles graphics and displays images. If this sounds old hat to you, stick with us for a few paragraphs; we just may surprise you.

Color and Monochrome

Like most personal computers, the ST can display images in both color and monochrome (black-and-white). But unlike most computers, Atari can drive either type of display right out of the box. On an IBM PC or clone, you have to specify which type of display you want and then pay for a display card and monitor to fit your needs. The situation in the Macintosh world is even worse: color is not even available on the vast majority of Macs. If you want Mac color, you have to be prepared to pay big bucks for a Mac II-series machine. It's the reverse on the Commodore Amiga; it was designed as a color machine from the start.

So the ST is a pretty unique bird, as graphics go. Moreover, the ST offers two color-graphics modes, not just one. This is nice and versatile, but you may have asked yourself why Atari chose these particular modes. To understand why, we need to take a look at how the ST manages its color display. (Don't worry, we aren't going into great detail at this time; let's just take the first few steps now.)

Picture Elements

Every computer display you're likely to see these days uses the concept of pixels, or picture elements. Pixels are an arbitrary division of the computer display screen into a matrix of x pixels across by y pixels down. Atari's color display is either

320 pixels across hy 200 pixels down (low resolution) or 640 pixels across and 200 pixels down (medium resolution). The monochrome ST display is 640 pixels across by 400 pixels down.

In the last paragraph, we used the word arbitrary to describe the division of a computer display into pixels. In truth, it's far from arbitrary. A large number of factors go into choosing the screen display size – from processor speed, memory size and storage availability to display sync rate and hus width. Engineers must balance the need for *the best possible* display against the very real component costs of increased system speed or data-transfer rate. Tbe higher the resolution (the more pixels across and down), the greater the number of data bits that represent that image within the computer's memory and the larger the file size for stored images. And that means more random access memory (RAM) chips and larger storage devices. In other words, more money.

As an example of bow image size has long been related to computer memory (and cost), remember Atari's first 8-bit computers, the Atari 800 and 400? Tbey came with eight kilohytes of RAM – that's right, 8K! And if you wanted to bring an 800 all the way up to a whole 32K, it only cost $800 or so, about what a 1040ST costs today. And for all that money, you could have just barely fit a single ST image into it.

Today, things are a bit different. RAM chips are relatively cheap and STs can store many images in memory at once. But the same cost vs. image quality equation still bolds. Today's super-duper bigh-resolution image-processor systems typically use a "true color megapixel" display. That's 1,024 pixels across and 1,024 pixels down with 32 (or 24) bits of color information per pixel. A true color megapixel image with no compression will require some 4MB of memory or disk space. And so we're in the same position as the Atari 800 owners who could barely fit an ST image into their RAM: We could barely fit a true color megapixel image into a Mega 4's memory!

A large number of factors go into choosing screen display size – from processor speed to display sync rate.

And just think about trying to move those 4MB images through a computer at any kind of speed. If you wanted to feed 30 frames per second of true color megapixel images to a monitor (30 fps is the typical television video frame rate), that would mean approximately one billion bits of data to be transferred each second! How could your ST's poor old 68000 central processor keep up? It clocks out at only about 8,000,000 single operations per second and even assuming that the 68000 could move a full 16 bits of data from memory to display witb each clock tick, that would still be only about one-eighth of the speed necessary.

Every computer display uses the concept of pixels, or picture elements, which divides the display into a matrix.

Everyone Wants More Bitplanes!

In the last section, we mentioned a true color display having 32 bits of color per pixel. What does that mean? Let's back up and start with monochrome displays; they're easier to understand. If we look at a typical monochrome display like the Atari SM124, it can have exactly two different colors on the screen, black and white. Every shape is actually composed of a combination of tiny black and white dots, or pixels, even gray-looking shaded fill patterns. Since the human eye can't distinguish between the tiny dots from a distance, they appear to blend together into a uniform gray color.

You must always remember that we're dealing with digital computers that, at their lowest level, only understand the binary number system. Binary numbers are made up of 1s and 0s and are based on the powers of two. Briefly, places in the binary system are assigned as follows, up to a decimal value of 64:

$2^6=64$	$2^5=32$	$2^4=16$	$2^3=8$	$2^2=4$	$2^1=2$	
1	1	1	1	1	1	1

Our monochrome choice of just two colors, can be represented by a single bit of data that takes either a 1 or 0 value. Eight bits make up a single byte, so we have the following arithmetic for a monochrome image file:

640 pixels across X 400 pixels down = 256,000 total pixels
256,000 pixels X one bit per pixel = 256,000 bits of data
256,000 bits / 8 bits per byte = 32,000 bytes of data

►

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The engineers knew Jack Tramiel wanted to produce a great graphics machine at a low price.

And surprise, surprise! Each and every uncompressed monochrome ST image file is 32,000 bytes, plus some additional bytes for certain other information. (Before you read on, try working out the math for a medium- or low-resolution color image.)

Medium-resolution color mode has four colors and, therefore, needs to have just enough bits assigned to each pixel to give four choices. It only takes two bits to give those four choices (which would look like 00, 01, 10 and 11).

640 pixels across X 200 pixels down = 128,000 total pixels
128,000 total pixels X two bits per pixel = 256,000 bits of data

Well, here we are again with 256,000 bits or 32,000 bytes of data per image.

Low-resolution color requires that each pixel be represented by enough bits to give 16 color choices. Looking at the table above, you can see that it requires four bits of color per pixel to give those 16 choices.

Now the math looks like this:

320 pixels across X 200 pixels down = 64,000 total pixels
64,000 total pixels X four bits per pixel = 256,000 bits of data

The same answer: 256,000 bits equals 32,000 bytes of data per image.

Now if you think that these numbers are the result of a series of remarkable coincidences, you're wrong. Atari's engineers knew the clock speed of the 68000, knew how fast they could move image data through their theoretical ST, knew how larger image sizes run up costs in all parts of a computer and knew that Jack Tramiel wanted to produce a great graphics computer at a low price. The engineers decided on the ST's three current modes to strike the best balance of performance and cost then available.

And what are those bitplanes we mentioned in the subhead above? Well, each set of bits per pixel can be visualized as a row of 1s and 0s stretching back behind its associated pixel in place on the screen. All of the first set of bits back from the screen would be in a single plane and all of the 32nd bits back would be in the 32nd bit plane. And that's why you hear of bitplanes and why the more you have, the better! By the way, you'll also hear of color being referred to as, "16 bits deep." If you think of the string of 1s and 0s behind each pixel, you can figure out where this phrase came from.

Next Time

Next time, we'll go deeper into bitplanes and look at other types of displays. Before we do, though, try calculating the exact number of data bytes in the megapixel display we talked about above. And, assuming that we need 24 of those 32 bits per pixel for color information, how many possible colors can we display at once on a single screen? (Careful, there's a trick here!) ■

Andrew Reese is the START Graphics Editor and was Editor of START for nearly two years. He's now the manager of the multimedia technical publications department of a large San Francisco Bay Area software firm, and still loves his ST.

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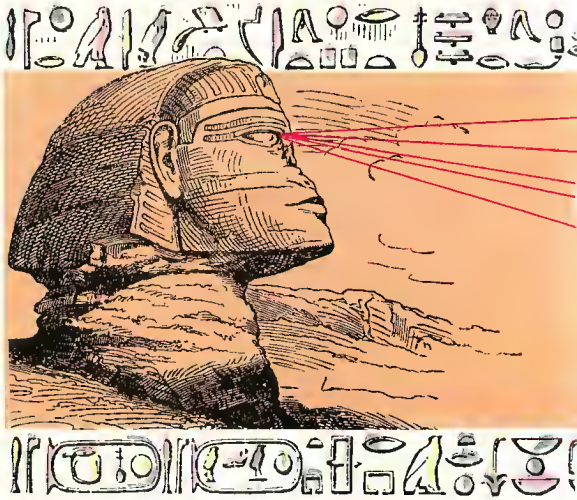
OF GODS AND GARS

In Which Laurence Reassembles Dad And Defenses

Eye Of Horus

REVIEWED BY MATT LAURENCE



Thousands upon thousands of years ago, when men were real men, women were real women and hawk-headed humanoid demigods were real hawk-headed humanoid demigods, the Egyptians created shrines of mind-boggling size to the benficent deities that watched over them. Of these gods, King Osiris, god of life and the living, was the kindest and most beloved, embodying all of life's most benevolent forces. The only one who didn't share these feelings was Osiris' half-brother, Set. Set, once a revered god, had since been overshadowed by his half-brother and (as embodiments of night and evil are wont to do) swore to destroy him forever. By clever trickery (or perhaps some inside god-joke to which we are not privy), Set managed to trick Osiris into lying down in a chest at which point he nailed it shut, then sent it down the Nile to destroy him forever.

Osiris' wife, the beautiful goddess Isis, got wind of Set's mischief and of course would not have this sort of foolishness. She retrieved the chest in time to save the dying king just long enough for a royal quickie, and thus was conceived a son. Osiris died in Isis' arms, and she hid the body in a tree to keep Set from finding and defiling it. Set, however, found the corpse and tore it into seven pieces to keep Osiris' spirit from resting peacefully. As long as

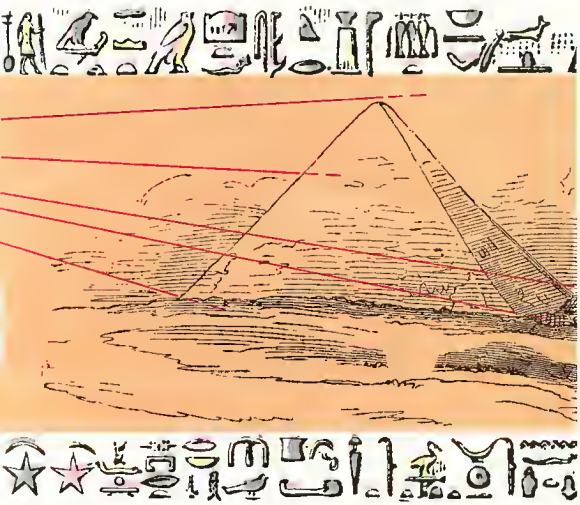
AT A GLANCE

Game	Eye Of Horus
Type	Role-Playing Adventure
Company:	Britannica Software 345 Fourth St. San Francisco CA 94107 (415) 546-1866
Price:	$39.95
Requirements:	512K, color monitor
Summary:	Fair game with nice graphics, sound and Egyptian theme.

Osiris' spirit remains uneasy, neither he nor his family can be honored on the walls of the tomb in heiroglyphics. Now, years later, it is up to Osiris' son Horus, hawk-headed god of light and good, to retrieve the scattered pieces of his dad, return them to the burial chamber and give uncle Set a good sound thrashing once and for all.

Where You Come In

With the burden of genealogy on your head, you set out as Horus in this new arcade adventure from *Fanfare*, Britannica Software's new entertainment division. Your job is



to enter the deep labyrinth of Osiris' tomb and reconstruct pop to save the family name. Set is enraged at your efforts and has turned himself into a dragon. He has holed up in the deeper, more dangerous parts of the tomb to await you and do you in before you can restore Osiris. In addition, he has used his magic to animate many of the heiroglyphics on the walls of the tomb that attack if you come too close.

For your part, you must travel through the corridors of the tomb, moving between them via elevators. Your major advantage in this game is that Horus has the ability to turn himself into a hawk at any point (except on an elevator), enabling him to gain more flexibility in movement and in offensive action. The hawk is much quicker and fires a more rapid stream of darts than the humanoid, but you must use the humanoid form to collect the necessary goodies on your journey.

Scattered throughout the tomb are a large number of useful thingamabobs that you must gather and use wisely. At the most basic level, some elevators must be unlocked before you can travel on them, and to unlock these you must find the properly colored key. In addition, there are amulets hidden amongst the heiroglyphics that can give you added powers, aid your quest, or give you extra life (the Amulet of the Steps is particularly useful - it maps your progress through the maze). Many of these amulets are necessary, and you must know the proper time to use each one, since you can only carry seven at a time. Finally, you must collect the actual body pieces and either bring them back to the burial chamber or summon Isis (with an amulet) to take them for you.

All of these items, while often extremely useful, may prove to be more trouble than they're worth – you see, the items are usually hidden among the living heiroglyphs that haunt and taunt you throughout the game. Some of the amulets require split-second timing to pick up without having your hair parted by flying axes or having a rabid duck nip your nose (no, I'm not kidding). This is more difficult than it seems, since you must be walking (e.g., not a hawk) to pick up any items you come across and Horus is no power-walker. He meanders along at a leisurely pace, making it difficult to dodge the fountains of knifes that explode if you saunter too near.

Through trials and tribulations you must battle through the deepest, most unfriendly parts of the tomb until you have found and returned all seven bits of Osiris to his rightful place of burial. Then you must find the last key, seek out the chamber in which Set has hidden, fight off the serpent heiroglyphics that he has guarding him, and defeat Set himself to score the ultimate victory.

Classy Eye

Eye of Horus is a classy game. The characters, story and heiroglyphs are based on authentic Egyptian mythology. The music is very atmospheric, lending to the feel of ►

the game, and the graphics are attractive and occasionally amusing. It is also a long game, however, and there is no save-game feature (though there is a pause key). In addition, it is very easy to die without accomplishing much – don't expect to get very far in your first few games; the evil guys are sneaky until you know where to look for them and the amulets don't look much like the pictures in the manual.

Other than these details, I had few problems. Some of the activation codes that serve as copy protection didn't work – I had to reboot and try another. This was simply bad planning; the fact that the disk bombed three days after I received the program was just bad luck.

None of these problems are enough to bury the game, however. Eye Of Horus an enjoyable game, with nice graphics and sound and a challenging mission. I had little chance to test it for lasting appeal, however, since it didn't last long enough for me to find out. Eye of Horus is a decent first offering from Fanfare.

Day Of The Viper

REVIEWED BY MATT LAURENCE

Take one part classic maze-chase game (Pac Man will do); add two parts Dungeon Master; sprinkle with a modified dash of Tower Toppler; throw in a cup of hot, hip, happenin' shoot-'em-up; sift in a bit of a moderately trite, but very atmospheric SF plot; top it all off with the very best features from the latest batch of action-adventure games, bake at the hottest action level you can take for weeks on end and what have you got? Day of the Viper, the newest release from Accolade software and probably one of their best to date.

AT A GLANCE

Game	Day Of The Viper
Type	Action Adventure
Company:	Accolade Software 550 South Winchester Blvd. Suite 200 San Jose, CA 95128 (408) 985-1700
Price:	$49.95
Requirements:	512K, color monitor, mouse
Summary:	Action-adventure melting pot slammer with style.

In A Nutshell

The scenario, in a nutshell: some bonehead at the Rore Corporation created a super-duper race of androids with super-fast brains, bodies of an assault vehicle and the reasoning ability and intuition of a human – but at supercomputer speeds. Thus was born the first of the GAR – Genetic Android Race. Created to mine the asteroid belts and pilot starships, these androids were the perfect psychopaths.

Of course, they weren't supposed to be psychopaths, but the GAR soon began to discover a subtle side effect of the "neurosynthetic melding" process: pain. Unhappy with this situation, GAR-1 (the most powerful and influential of the GAR) flipped out, declaring war on biological organisms of any kind. For 300 years now, GAR and his powerful army of antibiological robots have been smashing the Sun League Defense Force (SLDF) in their never-ending quest for death, chaos and the end of organic life everywhere.

In their headquarters, the SLDF has put together prototypes of weapons and shields that at least match GAR's arsenal, if not surpass it. Armed with this technology, carbon-based lifeforms (like us) could defeat these rustbuckets and get on with life. But GAR has taken over the SLDF complex and destroyed the program in the main Security Defense Computer and the last hope of defeating GAR has crumbled to iron filings. Someone has to sneak in there, wipe out GAR's evil minions, find the 25 disks that contain the backup of the Security Defense Computer program and re-activate the thing. And can you guess who that someone is?

Thot Someone Is You

Now don't worry, you don't actually have to go in there. SLDF has one ace in their seemingly shallow hole: a device known as VIPER-5, a human analog. This device is an android of GAR-like strength and speed, but with one difference – it has no brain to complicate things. It is a remotely-piloted assault android that a skilled technician can control to the last circuit. You must steer the only available VIPER-5 into the SLDF complex, survive the onslaught of GAR's buddies and complete the reprogramming of the defense computer.

Your Viper control console is a complicated mass of displays and buttons that will probably scare the pants off you the first time it comes on the screen. Since the game is entirely mouse-controlled, however, it quickly becomes a

breeze to navigate the console. The main display consists of two screens: a plotter screen and a monitor.

Viper travels between floors by use of the turbolift (a glorified elevator), and moves between buildings with the shuttlecraft that waits on the fifth floor. But getting to these vital rooms is no stroll in the park. You have the GAR-goyles and various other dangers to contend with. At the outset, your Viper is equipped with the most powerful weaponry currently available – but it is not strong enough to take you through all 25 levels of the SLDF complex. To beef up your firepower and defensive strength, you must find the weapons and shields that the SLDF research team has built. These are easily installed on your Viper, letting you penetrate further into the complex.

Day Of The Viper is probably Accolade's best game to date.

To further keep you from going "off-line," multicolored crystals and pods are scattered throughout the corridors. These capsules can lower your damage and raise your energy by varying amounts depending on the color. Snarf a few of these, and always keep a few in your storage compartments for lean periods. You can also find other vital objects scattered about that will make your quest much easier. There are even a few items so new that they haven't been officially documented. It is up to you to decide what they do and whether they are helpful or not. Note: If you ever find a beneficial use for the ubiquitous toxic waste containers, let me know.

Everything Right?

Day of the Viper does have a few annoying little problems. To begin with, one of its greatest features also proves to be an occasional drawback: The game is entirely mouse-driven. While this makes for extreme simplicity of control, it also makes for a worn-out mouse button and less efficient operation of some controls. At this point, my (admittedly old) mouse is one unhappy camper and my fights with the GAR degenerate into a battle with the mouse button. It would have been nice to be able to move your Viper with the arrow keys, which correspond perfectly with the directional buttons on screen.

The manual has some minor ►

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problems, including one or two misprints that could cause new players confusion: Some of the screen illustrations are mislabeled, with the arrows pointing to the wrong gauges when describing their functions. My advice on that front is to read the manual, but also experiment on your own.

When you first boot up Day Of The Viper (and after the deep, throbbing theme song, opening story, and copy protection), you'll probably goggle at the number of screen locations to keep track of, but it quickly becomes familiar. The opening, with its poignant music, attractive animation and authoritative mon*ologue*, immediately draws you in, begging you to start right in without touching the manual. Don't do it – you need to know your enemy and your allies before you go diving into the SLDF complex.

The programmers at Accolade have done just about everything right with Day Of The Viper. Everything, from the look and feel of the buttons on your console to the interface, have been implemented exquisitely.

Possibly the best feature of this two-disk game is that it can be installed on your hard drive and played without a key disk. The off-disk copy protection consists of a slide rule printed with different circuit-board modules. It is one of the best examples of off-disk protection that I have seen and I wonder why more manufacturers do not use it. It seems more effective than on-disk protection methods and I heartily applaud Accolade for employing it – it makes Day of the Viper that much better. ■

Matt Laurence has written numerous game reviews for Atari Explorer. This is his first appearance in START.

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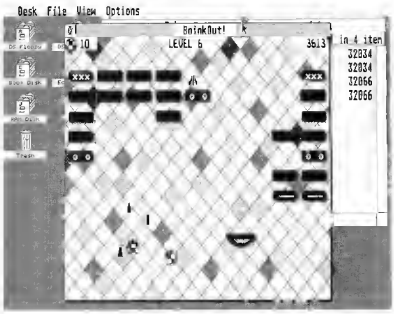
ADVANCED BLITTER

Multiple Animations

BY SAMUEL STREEPER

In this third and last column on programming the blitter, I'll build upon the first two lessons, blitting predefined bitmaps and flicker-free animation, and discuss multiple animations.

At this point you have a good grasp of the how to perform a blit. Now I'll show you how to weave those techniques into a program with simultaneously animated objects. The key problem here is tracking the animations; in other words, managing the blits. Since blitter functions are so useful when programming games, I've written one to serve as my advanced blitter example.



BoinkOut demonstrotes the use of multiple blits to create fast, smooth animation

AT A GLANCE

Program:	BoinkOut	
Type:	Tutorial	
Requirements:	512K, high or medium rez	
ArcFile:	BLITTER3.PRG	
Files:	BOINKOUT.C	BOUT3.C
	BOINKOUT.H	BOUT4.C
	BOINKOUT.PI2	CONVERT.C
	BOINKOUT.PI3	LASINIT.C
	BOINKOUT.PRG	LASSTACK.C
	BOUT2.C	MAKEFILE
	BOUT2.PI3	SVRO.C
Language:	C	

BoinkOut!

BoinkOut is an arcade game that combines elements from Breakout, Arkanoid and Boink, and plenty of its own tricks. The basic idea is to destroy all the bricks by hitting them with the ball, which you control with the paddle, while preventing the ball from dropping to the bottom of the screen.

There are 36 levels, each with a more difficult pattern of bricks. Bricks can be normal, wimpy, magic, multiple, or permanent. Magic bricks have a number of effects, either good or bad, including splitting a ball into multiple balls. Completing all 36 levels is a difficult task, but since BoinkOut runs as either a program or a desk accessory, you can play it a little at a time without losing your place when you need to run another program.

Multiple Animations

I prefer games with lots of animation; when something is destroyed it shouldn't just ►

disappear, it should do something interesting. In BoinkOut, when you hit a wimpy brick, it fades away. When you hit a permanent brick, it sparkles. Everything is animated and each animation involves a series of blits.

In addition, at least two animations are happening at any given time (a ball and the paddle), or there may be as many as a dozen balls and bricks that must be animated. What I needed was a method of managing multiple animations consisting of multiple blits. I solved this problem with list management techniques.

I prefer games with lots of animation; when something is destroyed it shouldn't just disappear, it should do something interesting.

My list is divided into two types of animations, background and foreground. The background animations, basically the bricks, don't move. The foreground animations, the balls, do. I update the background before I update the foreground.

First, I defined a structure that describes an animation, **ANI_STRUCT**, found in BOINKOUT.H. The field **frame** holds the blit number, which tells the program which stage of the brick's animation to display when the screen is next redrawn.

When a ball hits a brick, the brick's descriptor is added to the animation list. Each iteration, every animation in the animation list is displayed, by blitting, at its proper position on the screen, and its blit number is incremented. When the brick reaches its final blit number, it is removed from the animation list.

Blitting is what gives BoinkOut its speed and smoothness. You can't *pause* the game while you redraw the screen graphics; you must change those multiple animations quickly and cleanly. See **new_ball()** in the source-code file BOUT2.C.

Animating the foreground balls is more complex. BoinkOut has three kinds of balls: a spinning Boink ball, a winking eye, or a spinning Atari fuji. A different C function animates each ball. When adding the ball's descriptor to the animation list, I also needed to indicate which function performed the animation.

It would have been possible to include a value describing that function, and every iteration I could have performed code that looks something like this:

```
if (value == 1)
   animate_ball( );
else if (value == 2)
   animate_eye( );
else if (value == 3)
   animate_fuji( );
```

It should be obvious that this is inefficient. I need to make several comparisons every iteration just to figure out which animation function to call. Fortunately, C solves this multiple-function dilemma in an efficient way, using a technique known as function pointers. Instead of a variable value describing one of many functions, I can use a variable function, which looks like this:

```
extern int ball_ani( );
int (*ani_funct)( );
   /* variable pointer to the
      function */

ani_funct = ball_ani;
   /* assign the variable to the function
      that animates a ball */
(*ani_funct)( );
   /* Call the function;
      in this case, ball_ani( )*/
```

Because of this it's very easy to add another ball of any type to BoinkOut. I simply add a properly-initialized descriptor to the animation list, and the descriptor's animation function will draw the correct ball animation.

For balls, the descriptor is **BALL_STRUCT,** also found in the file BOINKOUT.H. To see how balls are added and removed from the animation list, see the **add_ball()** and **kill_ball()** functions in BOUT4.C.

Collision Detection

Perhaps the most difficult part in writing an arcade game is creating a good collision detection routine. Every game will have its own requirements, but my solutions may give you some insights.

Whenever I move a ball, I must look for collisions with the four walls, the paddle (which moves), and

You can't pause the game while you redraw the screen graphics; you must change those multiple animations quickly and cleanly.

The program runs as either a program or a desk accessory, simply by changing its name from BOINKOUT.PRG to BOINKOUT.ACC.

all the bricks. Some collisions are easy to detect: If the ball's x coordinate will be less than zero, the ball collided against the left wall and must bounce back to the right.

A paddle collision is more complex because both the paddle and the ball move. It was necessary to constrain the maximum movement of both objects to ensure that they cannot move through each other without ever colliding. BoinkOut keeps the last two positions of the paddle in order to calculate the paddle speed. Thus, when a ball collides with the paddle, a percentage of the paddle speed is added to the ball, which lets the user apply a little "english" to the ball.

Brick collisions are actually the most complex collisions in BoinkOut. It would be very inefficient to see if any point of a ball collided with a brick, so BoinkOut only checks four key points for possible collisions. Each point is checked to see what brick position (if any) it lies in. If a point lies within a brick position, BoinkOut checks to see if a brick is still there. If it finds one, it assumes a collision occurred. A brick descriptor is then added to the animation list, and the ball is bounced in the appropriate direction, determined by which point collided with the brick. To see how brick collisions are detected and handled, see the **bcollide**() function in BOUT2.C.

Other Things

BoinkOut has a secret demo mode (also known as cheat mode) which is invoked by closing the BoinkOut window and then re-opening it while pressing [Rigbt-Shift]. For a more difficult game (especially with a blitter chip!) BoinkOut has a "Fast Mode" which can be enabled from the menu. Fast Mode is exited by holding down both mouse buttons.

The program runs as either a program or a desk accessory, simply by changing its name from BOINKOUT.PRG to BOINKOUT.ACC. (For more information on writing software that runs as either a program or accessory, see "Accessorize Your Programs" in the October 1989 issue of START.) If BoinkOut is run as a desk accessory, you can get an information box by pressing [Left-Shift] while clicking on its menu entry. The BoinkOut picture files (BOINKOUT.PI?) must be in either the current folder or a folder named \BOINK.

BoinkOut was compiled with Laser C, although it should not be difficult to make it work with other compilers. Redefining LASER and MWC in the BOINKOUT.H file should allow Mark Williams C to compile it very easily.

I hope you find BoinkOut to be an enchanting game as well as a useful example program. Happy coding!

Sam Streeper, co-developer of SGS Net, lives in Palo Alto, Calif., and works for NeXT Computers.

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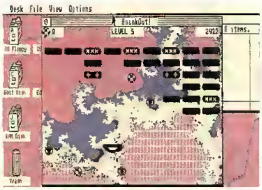

BainkOut . . . . . PAGE 75

BOINKOUT by Samuel Streeper . . . . . PAGE 75

In the final installment of our three-part tutorial on the blitter, Samuel Streeper discusses advanced blitter programming and shows you how to manipulate graphics in new and fascinating ways. BoinkOut demonstrates these techniques.

Galactic Merchant . . . . . PAGE 58

GALACTIC MERCHANT by Mark Butler . . . . . PAGE 58

The perfection of space travel in the latter part of the 21st century spawned a new breed of capitalist poised like a hungry tiger to pounce on the emerging interplanetary trade boom. These "galactic merchants" gained renown for braving interstellar pirates and meteor showers — anything to get a good deal! Now's your chance to join in on the fun.

Make It Move . . . . . PAGE 22

MAKE IT MOVE 2.0 by Rene De La Briandais . . . . . PAGE 22

If you've ever wanted to create wonderful animations easily, here's your chance. With this set of three programs you can create complete animations from a few DEGAS or NEOchrome images, complete with transitions and color effects — great for desktop video productions.

RESTART by Tom Hudson . . . . . PAGE 18

START Classic is a monthly feature that presents some of the most popular programs and utilities ever included on the START disk. This month we present Tom Hudson's ReSTART from Special Issue Number Four. It's a utility that lets you cold-boot your computer with just a few keystrokes.

■ compatible
□ not applicable

Article	Size	Memory: 512K	Memory: 1MB	Resolution: HIGH	Resolution: MED	Resolution: LOW	Notes
BoinkOut	BLITTER3.PRG 229K	■	■			■	
Galactic Merchant	GALMERCH.PRG 120K	□	□	■	■	■	
Make It Move Programs	MAKEMOV1.PRG 207K	□	□	■	■	■	
Make It Move Tutorials	MAKEMOV2.PRG 220K	□	□	■	■	■	Needs files from MAKEMOV1.PRG
ReSTART	CLASIC02.PRG 1K	■	■			■	First published in Special Issue #4

How to get START programs up and running

1) Write protect your disk.

2) Make a backup copy. We format the disk using TWISTER.PRG (written by Dave Small and Dan Moore, Summer 1988 issue of START) to increase the size of a single-sided disk to 400K. You can back up onto one Twisted, single-sided disk; one double-sided disk; or two GEM-formatted, single-sided disks.

NOTE: TWISTER DOES NOT WORK WITH GEM'S DISKCOPY.

To make a backup, open a window for your START disk, then drag the files from the window to the backup disk.

3) Store the original and use the backup hereafter.

4) Un-ARC the files. We use Double Click Software's DC SEA utility to create self-extracting archive files. To un-ARC a program, simply double click on the filename.

NOTE: IF YOU USE NEODESK'S ALTERNATE DESKTOP, DISABLE IT BEFORE UN-ARCING.

5) When the dialog box appears, choose Extract.

6) When the file selector appears, choose a destination disk (hard disk, RAM disk or floppy disk) for the uncompressed files. Make sure the destination disk has enough space for the uncompressed files, whose sizes are given in the chart on the previous page.

The screen goes blank, then the files are listed as they are extracted, and marked "OK" if the uncompression is successful.

COMING IN DECEMBER

The Atari STE
Graphics! Sound! Action! David Plotkin presents an in-depth look at the ST's latest incarnation.

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A review of the first paint program written specifically for the STE's 4,096 color palette.

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Waging a promotional war, Don Thomas and his Revolutionaries urge ST users to spread the word about the ST's powers.

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Look for all this and more in the December 1990 issue of START.

TV TITLES 2.0

Another Approach To ST Video Titling

REVIEWED BY
ANDREW REESE, START GRAPHICS EDITOR

In START's July 1990 issue, I reviewed a rather nice piece of software for video titling called Videotext from Water Fountain Software. Now, close on its heels, comes TV Titles 2.0 from Canada. It's a slightly different approach to the task of adding titles to your home or professional videos, but one that works quite well with a bit of practice, care and planning.

Out of the Past

TV Titles 2.0 came to START in a package reminiscent of the early days of over-the-counter software: a Ziploc baggie containing a single-sided disk and a small format manual. While barely adequate to keep the pieces together, this kind of packaging is certainly insufficient to protect the software in a retail or even mail-order environment. (We understand that the programmer, J.P. Deziel, is looking for a U.S. distributor; the packaging situation could change.)

But unzipping the package and reading through the manual produced some surprises. First, TV Titles 2.0 was written and compiled entirely in STOS, the British game development language published by Mandarin Software, which is a testimony to the power of this language.

Second, this is a well thought out package. It will load DEGAS/DEGAS Elite format images (.PI1 or .PC1) and provide transitions between them, but it does not include any facilities to generate those images. That omission was intentional: As the manual suggests, there are many programs on the ST that can generate text-filled images, so why add another one? (The author recommends Antic Software's Cyber Paint for its GDOS font handling and versatility. The sample screens on the disk were created with Antic's CAD-3D 2.0 and START's own RezRender from the November 1989 issue.)

TV Titles 2.0 is not copy-protected and can be installed on a hard disk, but likes to have an ST all to itself. You can boot TV Titles 2.0 in either low or medium resolution. It switches to medium, if necessary, for the menu and then to low to display the images. Clever, very clever.

To add titles to video, you need some way to pipe the ST image out to your VCR. If you have a 520STFM, a Practical Solutions Video Key or a JRI Genlock, you're in good shape. If you want to overlay your computer-generated images on video, the JRI Genlock is your only solution.

The Manual Was Right. . .

TV Titles 2.0 can manage a maximum of 12 screens at a time, but since it loads them all into memory at once, your display speed is not limited by disk I/O. With a 520ST, you will have fewer screens, but TV Titles 2.0 will still run. By the way, pay attention to the manual's warning about accessories – TV Titles 2.0 doesn't like them and will produce bizarre results if you run it with accessories

AT A GLANCE

Program:	TV Titles 2.0
Type:	Video Titler
Company:	J.P. Deziel R.R. #1, Box 6, Chelsea, Quebec Canada, J0X 1N0 (819) 827-0551
Price:	$39
Requirements:	512K, color monitor, any ST paint program
Summary:	Great for small-scale video production.

installed. I was not able to pin down which of the many accessories and TSR (AUTO folder) programs I use caused the conflict, but the program's author was certainly accurate in his description of the symptoms.

Also, be careful with cartridges. With my near-antique Shanner clock cartridge installed, TV Titles 2.0 runs fine, but I also happened to try running the program with Ambrosia's R/C Aerochopper. The only symptom was that the program would abort when I tried to load an image file, definitely an odd and potentially misleading symptom.

TV Titles 2.0 offers some functions that are just not available anywhere else on the ST. For example, each of the 16 colors in low resolution can be individually controlled to change to any other color over time. And that's not just any other current register color, but any of the 512 colors the ST can display! Or you can cycle through all or a portion of the ST's current color registers to achieve color animation effects. The interface is not as elegant as it could be, but it works. (You can only observe the color in a box border on the menu screen and have to change it by clicking on the plus or minus buttons.)

A New Approach, But It's Not GEM

TV Titles 2.0's interface is indeed interesting. First, it's not GEM. That means that you can save approximately one screen's worth of memory by booting the program in your AUTO folder so that it runs before GEM is loaded. But that also means the predictable (and limiting) ST GEM interface rules are not followed. Buttons that switch functions or that bring up dialog boxes are hidden; you either have to read the manual thoroughly first (hardly a bad idea anyway) or click anywhere on the screen to see if you can make something interesting happen. This last may not sound too professional, but I'll bet it sounds familiar. (Reviewers always try to emulate what could be called the impatient user's approach, also sometimes known as the idiot's approach. The key to this is to ignore the existence of the manual completely and see if you can make the program work – or crash.)

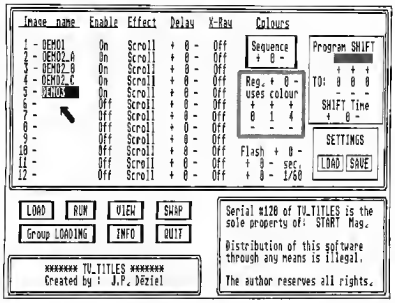
You work entirely from a single menu screen in TV Titles 2.0. Occupying most of the left half of the screen is a numbered list of the image filenames you're working with, their status (on or off), transition effect, delay and X-Ray status. You can change each of these settings by clicking on them or by clicking the plus or minus buttons when the filename is highlighted. You can swap one image for another at any time and you can also set up 10 different sequences of the same images with different delays and transitions. All of the sequences are held in memory at once, so that you can test one against another without saving and loading files. This is a very nice feature.

The right side of the screen is filled with color, and settings and function boxes that in some cases call up other dialogs. The file loading uses its own file selector, which is irritating only in that the OK button is called RETURN (why?). But the custom file selector does let you load a group of files within a path in alphabetical order. And you don't have to specify whether a file is a .PI1 or .PC1; the program figures it out and decompresses the .PC1s without asking.

The effects offered by TV Titles 2.0 are reasonable and well within the power of the ST to perform smoothly and consistently. The scroll is very smooth, although it suffers from the ST malady of not having overscan. For those of you who are not familiar with the term, overscan means that the screen image goes all the way to the edge of the picture tube. The ST does not have overscan, so it has borders that surround the image. If you use a keyer, like JRI's Genlock to overlay an ST image on a live video signal and then scroll titles up from the bottom of the ST screen, they will appear on the TV to begin above and end below the TV image. If the ST or STE had overscan, it would make it much better for desktop video.

In addition to scrolling, TV Titles 2.0 offers nice fading, a vertical wipe, a shutter effect like a Venetian blind, a fairly coarse but workable

continued on page 90



TV Titles 2.0 uses a single menu with some hidden dialogs to control how up to 12 screens of text are shown.

TIGER CUB

MIDI For The Rest Of Us

REVIEWED BY ROBERT EDSON

The rapid expansion of the MIDI market has software companies racing to produce the latest in high-tech, sophisticated products. This may be great for musical masters, but it leaves the rank beginner out in the cold. Leave it to Dr. T's to bring MIDI to the novice user. Tiger Cub, an entry-level sequencer, includes graphics editing, music notation and even multitasking.

This latest offering from Dr. T's Software is targeted for MIDI beginners.

Opening the Cage

Tiger Cub is a synthesis of several Dr. T's programs: The MIDI Recording Studio, Keyboard Controlled Sequencer (for recording and playback), TIGER (graphical MIDI data editing) and The Copyist (scoring). Key features of these programs are brought together and integrated under a graphical interface designed to get beginners up and running quickly. Tiger Cub also includes The Multiple Program Environment (Dr. T's' proprietary multi-application manager), which lets you switch between up to eight other Dr. T's programs, depending on your memory configuration.

The manual explains the basics of the three programs included in Tiger Cub, as well as general MIDI concepts, covered in chapters like "What's a MIDI?" and "Getting Connected." The bulk of the manual describes available functions and their use, including a short tutorial, reference tables and index. But the program is so friendly that you'll soon use the manual as a reference rather than a crutch.

Recording

The first screen, a Tape Recorder, displays 12 tracks with nine columns. The columns let you input information for your MIDI Channel, Solo/Mute Options, Instrument Name, Track Name and a 30-character Comment field. Both

AT A GLANCE

Product:	Tiger Cub
Type:	MIDI sequencer
Company:	Dr. T's Music Software 220 Boylston St. Suite 306 Chestnut Hill, MA 02167 (617) 244-6954
Price:	$99
Requirements:	1MB, medium and high rez
Summary:	A must-have for beginners (and a might-try for professionals).

the Recorder and the Edit screens include a GEM menu bar, with access to desk accessories. The desk accessories worked fine, but file-selector replacements, such as the Universal Item Selector III and START Selector caused the program to crash or lock up from time to time.

With recording enabled, Tiger Cub starts to record whenever it receives MIDI data or when you press the [Spacebar], or click the right mouse or play button. Tiger Cub always records to the next available track. Once recorded, tracks can be named, swapped, deleted or merged.

Editing

The Edit screen shows data in a piano-roll graph, where the vertical axis represents pitch and the horizontal axis represents timing. Bar lines and piano keyboard displays give you a general idea of your location in the song; a mouse position indicator shows your exact pitch and song position. The screen scrolls while your song plays, and all tracks are audible (unless muted).

The Track window shows each note's pitch, position, duration and velocity. Start playback from the current mouse position with the right mouse button. Edit with the left mouse button. You can edit individual notes or an entire track. A series of icons (or key commands) isolates aspects of the selected notes. To transpose pitch without affecting timing, simply drag the note(s) to its new position. The Edit Menu gives you even more options for manipulating note ranges. You can cut and copy, delete, split to another track, transpose, or quantize your selected notes.

Unfortunately, there's no way to find out what MIDI channel is assigned to a particular note or event and there's no way to split a track by MIDI channel. If you want to merge tracks with data on different MIDI channels, Tiger Cub tells you that editing after the merge will be "difficult or impossible," and lets you cancel out of the merge. This severely limits the complexity of your music as long as you want to retain the option of editing your work.

The program is so friendly that you'll soon use the manual as a reference rather than a crutch.

One of Tiger Cub's strengths is its controller editing. You can open different windows for all supported controllers. The right mouse button creates new MIDI data, while the left button is for editing.

More Than Just A Cub

In addition to the recording and editing functions, Tiger Cub also includes an instrument and drum-kit utility which stores banks of patch names for your instruments and MIDI drum setups. If you load this utility into memory, Tiger Cub handles all the housekeeping for those instruments' patch changes. If you have assigned channel 11 to your DX7, for example, recording on channel 11 automatically names the track's instrument column on the Record screen. Likewise, select the initial program change from patch banks in memory to automatically name the track.

When you edit drum parts, the drum name will appear in the mouse position indicator on the edit screen. Your favorite banks can be set to autoload. Tiger Cub also includes a separate MPE module, which reads SysEx files and extracts patch names. SysEx, however, is not supported and the MPE module, in its present incarnation, is a bit buggy.

The Quickscore MPE module transcribes your tracks into standard notation. It has no editing capabilities, but you can massage tracks to suit your eye by changing quantization values and bars per line. You can only view and print the notation; you can't edit. You'll eventually want a more sophisticated scoring program, but notation of any kind for the price of Tiger Cub is phenomenal. Printing is equivalent to draft mode in the Copyist: acceptable quality and quick.

You'll eventually want a more sophisticated scoring program, but notation of any kind for the price of Tiger Cub is phenomenal.

Like the MIDI Recording Studio, Tiger Cub can access the ST's three sound voices as if they were external MIDI modules. It's not outstanding quality, but it's adequate for getting started. And Tiger Cub comes with a library of sounds from the G.I.S.T. program by Antic Software.

The Good Doctor

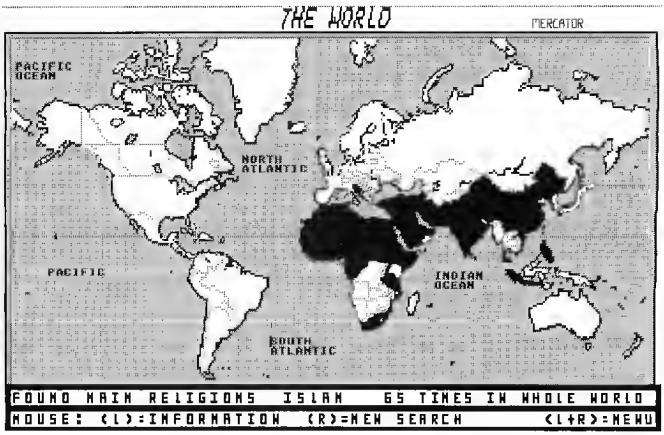
The folks at Dr. T's Software have clearly gone out of their way to make Tiger Cub intuitive and instructive. Once you understand the basic concepts of MIDI, you'll be making music with the best of 'em. ■

Robert Edson is a freelance musician in Atlantic City, N.J. This is his first appearance in START.

GEOGRAPHY TUTOR

Travel The World Without Leaving Home

BY RON SCHAEFER, M.D.



The world map with countries highlighted where Islam is a major religion.

When I was a little kid I played a game with my mother. I would sit on her lap as she spun a globe around, then she would say "Outer Mongolia" or "The Congo" and I would have to point out the country on the globe. It's 25 years later and half the names of the countries have changed, but I still play the same game, *only* now with my ST.

Geographically Speaking

Geography Tutor version 2.5 is an electronic world atlas for your ST. The program was written by Michel Rochon and is distributed by the Canadian firm ASDE Inc. Geography Tutor is not copy protected and runs in monochrome or color. French and German versions are available.

Geography Tutor is GEM based, so it is easy to use. To make it even easier, there are always instructions at the bottom of the screen that tell you what to do next. You can look at the whole world, or focus in on just one continent at a time. In

AT A GLANCE

Program:	Geography Tutor
Type:	Educational
Company:	ASDE Inc 151 rue Jolicoeur Hull, Quebec Canada J8Z 1X8 (819) 770-7681
Price:	$39.95
Requirements:	512K, low or high rez
Summary:	Solid educational software that is easy to use.

addition to the name and capital of each county there are 18 other facts, like the percentage of its Gross National Product a country spends on defense, or a country's literacy rate or life expectancy. Did you know, for instance, that Iraq spends a whopping 57 percent of its GNP on defense, a higher percentage than *any other* country? Or that the lowest average life expectancy for men is in Ethiopia at a mere 38 years?

The databases and maps included in Geography Tutor are: The World, North America, South America, Europe, Africa, United States and Canada. That's 137 countries and 63 states and provinces. For an additional $15 you can purchase a data disk that includes the Middle East, Eastern Asia, Islands of the South East and the Provinces of France and Spain. ASDE also *promises to offer* updated data disks every year for around $5, an important feature, considering how rapidly the world is changing.

One of the more powerful features of Geography Tutor is the ability to compare one country with another. For instance, you can color all the countries on the screen on the basis of doctors per capita. Or look at which countries consider Islam their major religion. You can easily switch back and forth from this graphical representation to a list of the counties ranked numerically or alphabetically.

The Quiz option tests your knowledge on the locations of states and countries. The program gives you the name of a county or its capital and you must click on the correct place on the map with the mouse. Another nice touch is that when you click on some of the countries, you will hear that country's national anthem. For an extra $20 you can get a disk that contains the national anthems of every country in the world.

Geography Tutor lets you create your own separate databases or modify and update the ones that come with the program. There is also room for up to four notes of your own to be added to the database for each country or state. These notes don't have to be text, they can also be DEGAS compressed pictures – a picture of that country's flag, or a map of one of the cities for instance. You'll need to create these drawings yourself.

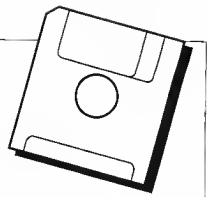
Finally, there's a construction set available that lets you create new maps and databases from scratch. ASDE will even help you market your maps and databases if you feel they are of commercial quality. It occurred to me that you need not be limited to geography with this construction set. How about an anatomy tutor in which you click on different organs instead of countries?

Solidly Educational

Geography Tutor is quite good for what it does and is a solid educational package. The ability to update and modify the database is a strong point, as is the Compare and Quiz features. Compared to the quality of maps found in an actual paper atlas, the maps in Geography Tutor are greatly inferior. This however, is not the author's fault – he's limited by the computer screen resolution. More close-up maps of areas of the world with lots of small countries would have been an improvement. Some of the maps are distorted from what I am accustomed to, South America in particular.

But, if you're into maps or just want to learn more about the world, then Geography Tutor is for you. ■

Ron Schaefer is a medical doctor and sometime programmer who lives in Pasadena, Calif. He wrote A.I. Doctor in the February 1990 issue of START.



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Reviewed: Mark Williams C. ; Menu+.

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On Disk: The aSTronomer: Text Compression and Huffman Coding with Personal Pascal: Flicker Animation Program; MIDISAVE.
Reviewed: Word Writer ST; Data Manager ST; Swiftcalc ST; Five BASICs compared

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On Disk: The Cartoonist; MIDI View; Ear Trainer.
Reviewed: Synth-Droid, Xsyn Patch Editors; Music Studio and Music Construction Set.

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On Disk: Home Budgeting; Exploring Prolog; 1987 Tax Template; Battle for the Throne.
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Features: The ABCs of Desktop Publishing; The ST in Business; Business Graphics; Database Overview.
On Disk: Card# STack Database; START Selector; Play the Market.
Reviewed: WordPerfect; F-15 Strike Eagle

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Reviewed: Microsoft Write

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On Disk: Naval Battle; World Discovery; Guitar Simulator; Byte Mechanic, ReSTART.
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On Disk: Vocabularian; Brickworks; ST Microscope.
Reviewed: Desktop Publisher ST; SMPTE Track; Softsynth; C Language Overview.

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On Disk: AVS; Sciplot; Appointment Calender.
Reviewed: LDW Power; MIDI Power; Superbase Professional.

DECEMBER 88

Features: Hardware
On Disk: Wombats II; Santa BBS; Discovery Construction Set; Five Sort Routines.
Reviewed: Moniterm's Viking Monitor; DynaCaDD; Five Hard Drives Compared; Ricoh PC Laser 6000.

JANUARY 89

Features: Editor's Choice.
On Disk: GFA BASIC 2.0; Spanish Mastery, STARTKey Revisited; Slither.
Reviewed: GFA BASIC 3.0; Creator and Notator.

FEBRUARY 89

Features: Thanks for all the Fish; ST: 1999.
On Disk: Dah-Ditter; Moon Calendar; Kamikazee Chess, Killer Chess; VCR Organizer.
Reviewed: Atari's Planetarium; Robtek's Skyplot; Mirage Sample Editor's.

MARCH 89

Features: Three Artists Who Use the ST; Software Rental.
On Disk: Seurat Draw and Paint Program; Assembled Saucers; ST Coloring Book.
Reviewed: Graphics and Animation Programs Compared; Digigram's Big Band; Overview of Six CAD Programs.

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Features: Jimmy Hotz's MIDI Magic; Dr. T Inteview; The New TOS ROM Error Codes.
On Disk: ST Writer Elite 3.0; Poker Solitaire; RAM Baby.
Reviewed: Utilities; R/C Aerochopper, MIDI Draw.

MAY 89

Features: CompuServe's Sports Forum; Atari Goes to College.
On Disk: Space Wars 2400; GFA Object; 1988 Tax Template; SIFT (START's Instant File Tranlator
Reviewed: Buyer's Guide to Telecommunications Programs; Calamus.

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Features: Do Anything Business Computer; Arcade Addiction.
On Disk: GFA Vector, Match Quiz St; Screenwriting with WordPerfect; ST Pinochle; Exploring Spreadsheets; Traveling Mattes.
Reviewed: Juggler II; Switch/Back; Revolver; Graphics Tool from Migraph; MIDI Drummer.

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Features: MIDI in the Future Tense; Making MIDI Affordable
On Disk: Babel; GFA Object; The ST Theremin; START Arcade
Reviewed: Sound Digitizers; EZ-Score Plus; Pagestream; Turbo ST 1.4; Hi Soft BASIC and Hi Soft BASIC Professional.

AUGUST 89

Features: Secrets of a Good User Interface; Tools of the Trade
On Disk: POGO; File Search; Splines on Splines; Stumbling Blocks
Reviewed: Ultrascript; DevpacST; dBMAN V; After-Market Floppy Disk Drives; MIDI Magic

SEPTEMBER 89

Features: Sam Tramiel Interview; Computer Game Violence
On Disk: Avecta I: Ebora; The Seven Skulls; Newspeed; Slither Screen Editor; Cinko
Reviewed: Eight Games; Fleet Street Publisher 3.0; STAC, STOS and TaleSpin; NewScore

OCTOBER 89

Features: STACY and Portfolio Preview
On Disk: CAD-3D-to-DynaCADD Converter; Schedule Maker; ST Softguide; WordPerfect Macros; Boingo
Reviewed: DynaCADD 1.56; Hotwire, NeoDesk 2.0 and VDOS ProQueue; Entry-Level Sequencers; Computer Guide to the Solar System

NOVEMBER 89

Features: The Transputer Connection; Atari and Perihelion; Donny Osmond Interview; The START Disk's New Look
On Disk: RezRender; JULIA; Final Approach Controller

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Features: The Future of Atari Computing; A Small Tour of UNIX, Pt. I; Elmtech's ParSec Graphic Interface
On Disk: GFA Companion; Attack!; Word Puzzle
Reviewed: Accelerator Boards; Beat Box; Mice

JANUARY 90

Features: A Small Tour of UNIX, Pt. II; CD-ROM; Battle of Britain
On Disk: CAD-3D tp DXF Conversion; Mystic Realm; Laserdisc Remote Control; Score ST
Reviewed: Supercharger & Spectre GCR; Diamond Back & Hard Drive Turbo Kit; ST Pictascan; BetaCad

FEBRUARY 90

Features; A Small Tour of UNIX, pt. III; TT-/TOS Secrets
On Disk: Chaos on your ST; Crunch Time Football!; X-10 Controller; Al Doctor
Reviewed: Finex V; Final Cut; The Cuckoo's Egg

MARCH 90

Features: Robert Williams Interview; A Small Tour of UNIX, Pt. 1V
On Disk: CAD-3D 1.0 Mountain Solitaire; Spinwheel
Reviewed; Clip-Art Overview; Rmovable Hard Disks; BeckerCAD

APRIL 90

Feature; Word Processorr Comparison; PHA$AR Tips
On Disk: ST Writer Elite 3.6 PHA$AR 3.0;89 Tax Templates; Super Jackpot Slots
Reviewed: Desktop Publishers Overview: PC Speed

MAY 90

Features: Telecommunications, Sound Designer Scott Gershin Interview
On Disk: InfoBase ST; ST; Styzor's Contest; Computer Viruses
Reviewed: Critical Path; Dr. T's T-BASIC; VIDIST; WordUp 2.0; FAST Tape Backup; Protext

JUNE 90

Features: Alexey Pazhitnoz Interview: Wayne Gretzky Hockey; Sexist Software Perpective
On Disk: Bugs!; Crossword Creator; Wordle; Warrior STi Fun Pages
Reviewed: For the Fun of It (11 Games); WORDFLAIR

JULY 90

Features: Midi Pros Go ST; Multitasking on the ST; Computer Hazards
On disk: Alter Tune; Midi Master Drummer; Midi Programming Tips; Sampsyn
Reviewed: PC-Ditto II; Videotext; For the Fun of It

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On Disk: CardMaster; Metamorph; SBLIT
Reviewed: Deskset II; Cubase; For the Fun of It; DC Utilities

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TRACKER/ST

Sophisticated Mail-Merge Program For Small Businesses

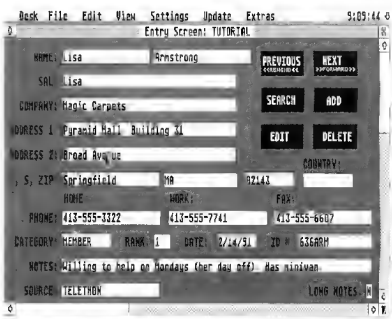
REVIEWED BY DAVID PLOTKIN, START CONTRIBUTING EDITOR

Tracker/ST is a mailing list database that lets you compile a list of names, addresses, phone numbers and associated information, then use that list to generate form letters and mailing labels in an impressive variety of formats. It is menu-driven and employs on-screen buttons, but is hampered by a non-standard interface, and some functions that do not work under TOS 1.4.

First, The Entry

Tracker/ST is divided into three sections: the Entry screen, the Power Station and the Text Editor.

The Entry Screen



AT A GLANCE

Program:	Tracker/ST
Type:	Integrated database for small businesses
Company:	Step Ahead Software Inc. 496-A Hudson St. Suite 39F New York City, NY 10014 (212) 627-5830
Price:	$79.95
Requirements:	512K
Summary:	Excellent mail-merge database though interface does have some problems. A little buggy under TOS 1.4.

The Entry screen is where you enter data. The data format is fixed – but the screen includes all the "normal" mailing-list fields as well as a few special ones that can be quite useful. Fields include name (first and last), salutation, company, address, three phone numbers (home, work and fax), date, ID number, category, rank, source and a single line called "short notes."

Fields such as category and rank aren't for any fixed use, but can have a variety of purposes. A special characteristic of rank (which must be a number) is that there is a menu command that "counts down" rank. That is, each time you implement that command, all the values for rank decrease by one. Thus, rank can be equated to "number of issues remaining" in a subscription database, and each time you send out an issue, you can decrement rank by one very easily. The Entry screen includes a "long notes" field that invokes the text editor. The long notes can be of virtually any length and are saved as part of the database.

The menus on the Entry screen pack a lot of power. The File menu lets you load/save a database, import and export your data in several different formats, rename, delete and start a new database. The Edit menu lets you add or delete entries, or just edit a certain field of every

record. The View menu lets you move through the entries (including a search by name or company) or look at them in Browse mode (columnar format, like a spreadsheet). The Settings menu lets you change your defaults, such as whether the first or last name is automatically shown in the salutation field. Additionally, you can sort by company or last name, *spool to a RAM* disk and set the time and date.

One of the most powerful features of Tracker/ST is the Update menu. This lets you change any field with a specified value to a different value. This can be very handy, for example, if you misabbreviated a state, and you want to go back and correct it. The final menu, called Extras, lets you perform housekeeping, such as cleaning up your database (which should be done periodically after heavy activity), counting the number of records, printing a single label and deleting the long notes for an entry. The screen also contains a series of buttons that work much like the menus. Click on a button or type the first letter of the button name to activate its function.

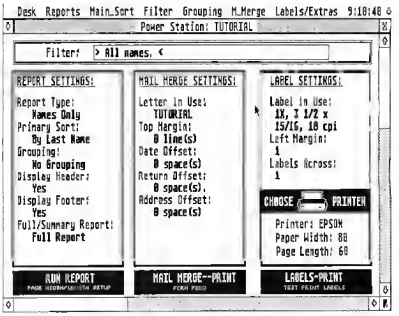
Moving through the Entry screen to enter data is a little bit strange, because even though the screen looks just like a dialog box, it is not. You can't click on a field and then enter data for that field. Also, neither [Tab] nor the up/down arrow keys work to move from field to field. Instead, you must press [Return] to move forward; [Control]-[Return] to move backward. Clumsy, but manageable.

The Power Station

The Power Station is where you use the data you've entered. You can run reports, do a mail merge or print labels. Each of the main categories has its own box on the Power Station screen, showing the important settings. Again, this screen is misleading because you can't click on a setting and change it – you must make a menu selection to make any changes. To then perform an action, such as run a report, you must click on the appropriate button or press the keyboard equivalent.

The first step in using the Power Station is to set the filter. Once a filter has been set, only those records that meet the conditions of the filter will be affected by further operations. For example, you could print out labels of only those people in the state of California. The filter can be based on any field, but not a combination of fields (i.e., you can't do something like "people who live in Alabama and have a rank less than four").

The Power Station



Mail Merging

Tracker's Mail Merge function is based on a template. This template is constructed using the text editor. It is not a true mail merge, as the address information and salutation is all that is added to each copy of the template in use. You cannot ask for any of the fields to appear in the body of the letter as you can with "real" mail merging. A variation on this is the "Quick Letter," where you can modify a template and print it out for a single name, without affecting the model template it was taken from.

Tracker/ST can also generate labels. It comes with standard and Rolodex-style labels built in, but you can design and save your own label formats. These formats can specify which fields appear on each line (multiple fields can appear on each line), how many labels across you want to print and spacing. It takes a certain amount of experimentation to get the format to match the labels exactly, but there is a function that generates Xs to quickly test your format. Once you have it right, you can save it to disk for future use.

The Editor in Tracker/ST doesn't appear on any menu or button, but the program is smart enough to take you there when need be – such as when you want to add a template or modify some long notes. The Editor has enough functions to get the job done, including filing, block operations, cut and paste, styles (bold, italics, underline, etc.) and a ruler for setting margins. These margins can be set for each paragraph. It does not do tabs, nor can it search and replace. Fortunately, at least for templates, ►

you can import an ASCII file from another word processor, though you must then add any styles you want in the Tracker/ST text editor.

One of Tracker/ST's most powerful features is the Update menu.

An Excellent Database, But...

Tracker/ST is an excellent database, but, as mentioned earlier, it is hampered hy an interface that is clumsy in spots, dangerous in others and is partially nonfunctional under TOS 1.4. To he fair, it is not the fault of the author (Nevin Shalit, who certainly knows what an interface should and shouldn't do). The program was written in compiled Superbase command language. This language is pretty fast and loose about the "rules" for programs on an ST. For example, many alert boxes do not have the heavy box around the default choice (the one activated when you press [Return]), yet a choice does take effect when you press [Return] – but which one? The buttons on the alert and dialog boxes are fixed text and there are a set number of them. Thus, you may have to click on Cancel when you want to select "next line," and you have to remember to type in keywords such as "no" or "done" instead of clicking on buttons. More importantly, you are sometimes presented with a hutton or a file-selector line that the manual warns you not to use. Problem is, these things couldn't be turned off.

This is also true ahout the Entry screen scroll bars. You're warned not use them, but if you do, you're faced with a blank screen. Further, and much more dangerously, clicking on the right scroll arrow causes a two-homb crash (at least in my case – Shalit wasn't able to duplicate this problem). The number of menus is also limited by the language, so that there isn't room for all the necessary entries. Thus, some menus include a choice to call up a different set of menu items. What this means is that some menu items require two mouse actions.

Under TOS 1.4, mouse clicks on buttons don't work. This is not a big prohlem hecause each button has a keyhoard equivalent. However, Precision Software, Superbase Pro's creators, doesn't seem inclined to fix the problem.

Tracker/ST has an excellent manual, which includes a tutorial and extensive reference section, index and appendices detailing such important information as importing data from other databases. In fact, if anything, the manual might be a hit too extensive, repeating passages of text over and over for commands that work the same.

Overall

Making allowances for the interface, Tracker/ST is an excellent database for handling phone/address lists and simple mail-merge needs. It is powerful and easy to use, and if you have extensive needs in this area, it's definitely worth a look. ■

TV TITLES

continued from page 81

spiral and a confetti-like effect called "Disolve" [sic]. You can elect to keep up the previous image and gradually place the new image over it, or replace the old with the new. Because it's an image-based system, you can't scroll characters onto the screen one at a time, like in Videotext. But it's still a very nice and flexible system. It does have one major limitation, however: the palette.

Unlike Water Fountain's Videotext, TV Titles 2.0 maintains only a single palette for its 12 screens. If you're careful and manage your palette well, you can achieve reasonably complex-appearing effects with just the 16 available colors. The manual offers several good hints in this regard and you can easily select which palette from the 12 possible images you want. And if all you need is to scroll 12 screens of one- or two-color opening or closing credits over your video, TV Titles 2.0 is perfect. But any of the fancy color effects you can get in TV Titles 2.0 affects all of the images; colors that cycle in Image 1 will also cycle in Image 12, whether you want it or not. As I said above, you need to use a little care and planning.

Which To Buy?

Overall, I liked TV Titles 2.0, even better than Videotext. They take different approaches to the same task and are really complementary. If you want single-character *titling*, more varied wipes or multiple palettes, then Videotext is your only ST titling answer. If your needs are more modest and you have some other way to generate the text and images you need for TV Titles 2.0, then go with it. It's less ambitious than Videotext, hut more reliahle, as well. And at the price, it's an excellent deal. Both Videotext and TV Titles 2.0 are the products of the cottage programming industry and their support systems are limited; unless another publisher elects to puhlish TV Titles 2.0, you'll have to call the author in eastern Canada for support – and only between the hours of 7 p.m. and 9 p.m. ■

Andrew Reese is the START Graphics Editor and was Editor of START for nearly two years. He now works for a large San Francisco Bay Area software firm, and still loves his ST.

BY MARTA DEIKE

Thrills and Chills

Data East presents **Drakkhen**, a 3D, real-time, role-playing adventure set in medieval times, with dragons and damsels in distress. Bethesda Softworks (now affiliated with Novagen Software) has finally released the sequel to Mercenary, **Damocles**, a 3D, intergalactic, role-playing adventure that requires the best of your detective skills and sense of humor.

Drakkhen, $59.95. **Data East, 1850 Little Orchard St., San Jose, CA 95125, (408) 286-7080.** Damocles, $44.95. **Bethesda Softworks, 15235 Shady Grove Road, Suite 100, Rockville, MD 20850, (301) 926-8300.**

Niche Corner

Penatech (Power Electronics Network Analysis Technologies) has carved a space in their software line for electrical engineers. If you're an analog circuit designer involved in network analysis and control systems, check out **The Bode Plotter.** The highlight of the program is the option to obtain semi-log gain and phase response plots of s-domain expressions in high-order systems. The Bode Plotter, $149. **Penatech, 16058-B English Oaks Ave., Bowie, MD 20716, (301) 249-0496.**

Where's The Error At?

Put away your red pencil; Phil Comeau Software presents **The GramSlam Grammar Checker.** GramSlam checks documents for common grammatical errors, wordy phrases and misused words. It reports your problem phrase in context, describes the problem and offers alternatives. Used in conjunction with a spell checker, GramSlam could be your ticket to impeccable papers. The GramSlam Grammar Checker, $15. **Phil Comeau Software, 43 Rueter St., Nepean, Ontario K2J 3Z9, Canada.**

Upgrade Update

Owners of the sophisticated database Sales-Pro, from Hi-Tech Advisers, have even more flexibility in **Sales-Pro 5.25.** The new version features additional transaction applications as well as more elaborate printing options. Version 5.25 also includes the new bar-code accessory #3. The Sales-Pro series retails from $99 (for the standard program) to $599 (for the muscular Super Sales-Pro). Registered owners should contact Hi-Tech for upgrade info. **Hi-Tech Advisers, P.O. Box 7524, Winter Haven, FL 33883-7524, (800) 882- 4310 (U.S.), (813) 294-1885 (Canada).**

Musicians Take Note

Passport Designs has just released two new products for the ST. **Trax** is an entry-level, 64-track, personal recording studio on disk. The program is geared for beginners, with options to add music, sound effects and sampled dialogue to presentations. Based on the award-winning Master Tracks Pro, **Encore** is a remarkably intelligent program that gives you fast, intuitive techniques for entering music. It transcribes and prints scores, parts and lead sheets on any Postscript compatible laser or lino printer.

Passport is also publishing MIDI records, commercial recordings converted to data song files. The files can be loaded into any MIDI sequencing program, synthesizer or controller and edited. The first MIDI Records Catalog lists over 300 MIDI records in nine different categories, from Ellington's "Take the A Train" to special packs like "Abbey Road."

Prices for MIDI records vary. The catalog is free. Trax, $99.95. Encore, $595. **Passport Designs, 625 Miramontes St., Half Moon Bay, CA 94019, (800) 443-3210.**

Opcode Systems has entered the Atari world with their first ST product, **E-mu Proteus Editor/ Librarian,** which includes a Preset Editor, a Master Parameter Editor, a Program Map Editor and a Tuning Editor. The program's patch librarian lets you store and organize thousands of sounds on one disk. E-mu Proteus Editor/Librarian, $149. **Opcode Systems, 3641 Haven, Suite A, Menlo Park, CA 94025-1010, (415) 369-8131.**

Antic
FOR ATARI XE XL 800: THE ONLY RESOURCE

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I/O BOARD

NEVER TOO LATE

I am a new owner of an Atari 800 (which is probably seven years old) and am trying to learn how to use it. Last winter I joined "SeniorNet" out of the University of San Francisco (part of the Delphi online network) and am trying to get on the network so I can communicate with other seniors.

I am familiar with the Atari 800 because my grandson had one (and still does) and sometimes he'd bring it to my house. Your magazine is my only source of information — please don't fold up on me!

Mahel Payne (age 72)
Indianapolis, IN

SeniorNet can be reached at 399 Arguello Blvd., San Francisco, CA 94118. (415) 750-5030. — ANTIC ED

MORE DTP ATARI

I enjoyed Dave Plotkin's "Desktop Publishing with Your 8-bit Atari" in the June/July issue of Antic.

The address and phone number given for Hi-Tech Expressions are no longer operative. A more recent address is 584 Broadway, New York, NY 10012. There is also a toll-free number: (800) 447-6543.

I recently purchased the Awardware supplementary graphics disk from Hi-Tech at the above address ($10.50 including shipping), and don't recommend it. The disk is essentially a copy of the graphics furnished with Print Power.

The Newsroom from Springboard is a great program, on a par with Print Shop. My only complaint is that Newsroom is heavily copy protected. Fortunately, many dealers (including those advertising in Antic offer it for around $15 — at that price it's a steal!

Thanks for a great magazine!
Benjamin Poehland
Frazer, PA

POWERPAD SOURCE

Your June/July 1990 had an I/O letter asking about sources for Chalkboard's PowerPad, the large-size drawing tablets. Here's some good news. The entire multi-computer PowerPad line is available from Dunamis, 3620 Highway 317, Suwanee GA 30174. (800) 828-2443; in Georgia (404) 932-0485. Dunamis Inc. even introduces new PowerPad supplies and publishes a quarterly newsletter/catalog. The PowerPad works great with the old MicroIllustrator cartridges. I'd like to hear from any readers who know about programs that were written to assist handicapped users to operate the 8-bit Atari via the PowerPad.

Melvin Waller, Jr.
Portland, OR

The manufacturer of the PowerPad, Dunamis, also runs a non-profit, educational foundation dedicated to helping handicapped users. According to representative Ben Satterfield, they will sell their remaining Atari software (PowerPad not included) for only the cost of shipping and handling. Programs available include MicroMaestro, MicroIllustrator, the Programming Kit, and a number of educational programs especially suited for children with special needs. For more information, call or write at the address above. — ANTIC ED.

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(entertainment software)
Change In Heat
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MY FINGERTIP BUSINESS

(small business software)
Chameleon Software
1013 Marvern Drive East
Chambersburg, PA 17201
(717) 267-0904
$14.95, 64K disk

The first of many planned interactive modules, My Fingertip Business includes the following built-in forms: Conditional Sales Agreement, Indemnity Agreement, Limited Power of Attorney, Notice of Overdue Account, and more. The "fill in the blanks" design makes forms easy to use. The included full-featured invoicing program includes automatic sub-totals, grand totals, extension totaling, a monthly invoice total, complete printouts and other useful options. You even get an "Inspirational Quote of the Day," a screen clock, DOS functions, and a HELP option.

To help you get the most from your system, three different formats are available: non-RAMdisk, 64K RAMdisk or extended RAMdisk. Not copy-protected, the program is compatible with the 600XL, 65XE, 130XE or XEGS with a minimum 64K RAM.

ESCALPAINT

(paint program)
MAPDA — USA Branch
c/o Steve Hoffee
333 Peninsula Dr.
Lake Almanor, CA 96137
(916) 596-4159
($20, disk)

BESCALPAINT, a new paint program from the Munich Atari XL/XE PD-Association (MAPDA) of Germany is being sold through a U.S. branch of the club. Demo disks are available, several demonstrating art ported from the Amiga and then touched up for the 8-bit Atari with ESCALPAINT.

Written by MAPDA member Volker Eloesser, this impressive program lets 8-bit users create art with both delicate grey-scale shading plus 256 colors — chosen from a potential palette of 25,456 colors. (Some users may have already earlier versions of the program or demo disks using the name DIGIPAINT. The disks were circulated before MAPDA became aware of a conflict with an existing Amiga paint program, Digi-Paint from NewTek.)

The public domain demo disks are available from the MAPDA ($3 each for shipping and handling), or may be available from your local users group. The ESCALPAINT program can be purchased through MAPDA U.S.A. for $20.

In addition to ESCALPAINT demo disks, MAPDA produces a bi-monthly magazine on disk ($5 per issue). Each issue includes art, reviews, programs and articles on programming — the January 1990 issue began an Assembly Language tutorial. The magazine is produced in both German and American editions. Current English-language editions have suffered a bit in translation, but arrangements have been made for better and faster translations, thanks to the help of German-speaking members of ABACUS, the Atari Bay Area Computer Users Society.

SLEUTH, POWERMENU, CSS DISASSEMBLER, ULTIMAPPER

(utilities/game aid)
Creative Software Systems
8715 ValleyView #3
Berrien Springs, MI 49103
48K disk

From Creative Software Systems comes a set of useful utilities designed to work in both single and enhanced density. The Sleuth ($17.95) disk utility package features a sector editor, file copier, two sector copiers, a directory function that lets you sort files, and an undelete option. For assembly language programmers, the CSS Disassembler ($8.95) will disassemble M/L programs from memory, disk file or a specified sector. PowerMenu ($6.95) lets you access the Lock, Unlock, Delete, Rename and Format commands of DOS from one easy-to-use, menu-driven shell. A combined set of all three utilities is available for only $25.95 plus $3.50 shipping and handling. (For single copies add $2.50 each for shipping.)

For fans of the adventure game Ultima IV, Ultimapper ($5.95) provides complete maps to all of the towns, castles, villages, dungeons and even the world of Ultima IV. (Requires an Epson-compatible printer and Ultima IV.) Or, for $7 (includes shipping and handling), fans can get a complete set of laser-printed maps. A demo disk of all four programs is available for $3. ■

Return of the kitchen-table Atari developers...

THREE NEW 8-BIT REVIEWS

Trans Keyboard, AVUE, Black Box

TRANSKEY

Horness the power of a PC keyboard for your Atori

Review by Matthew Ratcliff

The Transkey is a hardware modification for all 8-bit Atari computers, which allows you to hook up an IBM PC keyboard to your Atari. IBM PC keyboards come in two styles, XT and Enhanced (also called AT or 101 key), and Transkey supports both. Adding an IBM keyboard to any Atari computer can vastly improve your typing speed and quality, while simplifying all editing functions. The hardware includes a small circuit board with its own CPU, ROM software, support circuitry, and an extra ROM socket for future expansion. Version 1.1 of the ROM software was tested for this review.

Two versions are available. One must be soldered in, while the other simply plugs in — if your computer has a socketed POKEY chip. The solder version comes with a flat ribbon cable that connects to the Transkey circuit board, with 10 solder connections to be made to the POKEY chip at the opposite end. In the plug-in version, the ribbon cable plugs to a small "piggyback" circuit board. You remove the POKEY chip from the computer and plug it into this small board, which you then plug into the POKEY socket. The circuit board fits neatly under the metal RFI shield on all systems except the 1200XL. For the 1200XL the RFI shield must have a small hole cut in it, or be removed completely, to accomodate the Transkey circuit board. It is held firmly in place with double-sided tape provided with the upgrade kit.

There are four more connections to be made. These make it possible for Transkey's IBM keyboard interface to handle the [START], [SELECT], [OPTION], and [RESET] keys. If the computer is fully socketed, these wires may simply be friction-fit between pins on certain chips and the sockets they plug into. Otherwise, some soldering is required to attach the wires to the proper locations.

Check your 800XL computer before ordering, to see if it is socketed. Only about a third of all 800XL computers (maybe less) are socketed. If not, there's no point in paying the $10 extra for a plug-in version. All Atari 400, 800, and 1200XL systems are socketed, so it would be advantageous to order the plug-in version. None of the 130XE, 65XE computers are socketed, so order the solder version. If you are not experienced with soldering, enlist the assistance of someone from your local Atari computer club or Atari dealer, if possible. Soldering mistakes can be costly.

The Transkey comes with another connector and cable that brings out the standard IBM keyboard interface. This may be an in-line connector (like a keyboard extension cable), or a chassis mount. (Specify your choice when ordering.) If you're not squeamish about drilling a 5/8-inch hole in the computer case to mount the keyboard connector, this is better than having a short cable and connector dangling from the back of the machine.

The documentation details installation procedures for the Atari 400, 800, 1200XL, 600XL, 800XL, and 130XE computers. Designer Michael St. Pierre informed me that it would probably work with an XEGS, but has not been tested. Finding all the connections might be a bit difficult, since the XEGS circuit board has a unique layout.

The descriptions are accompanied by detailed, professional-looking drawings. Complete wire connection lists are included as well. The circuit board is a very clean design, expertly crafted. There were numerous spelling and grammar errors in the instructions, ►

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but overall the information is accurate and gets the point across.

A Better Keyboard?

Once the Transkey installation is complete, simply plug in just about any IBM compatible keyboard, power up the computer, and begin typing. The only flaw I discovered with the Transkey is the keyboard "roll-over" feature; it's too sluggish. When typing on the PC keybard and Transkey, I must slow my typing noticably, as compared to my average typing speed on an IBM PC system. This takes a minor bit of getting adjusted to, and will probably only be noticed by fast touch typists. It is still far more responsive than the original Atari 800XL keyboard.

The first big plus for the Transkey is the fact that you can use arrow keys on the keyboard to move the cursor. All those [CONTROL] key combinations ([CONTROL]-[MINUS], [CONTROL]-[+], etc.) are no longer needed to move the cursor. This makes it a pleasure to edit programs.

The HOME key moves the cursor to the top left of the display. SHIFT-HOME clears the display. The END key moves the cursor to the lower left of the display. The PAGE-UP and PAGE-DOWN keys move the cursor to the left and right edges of the screen, respectively. To insert a character on a line, simply press the INSERT key. SHIFT-INSERT will insert a complete blank line. Press the DELETE key to delete characters. In most cases, these editing sequences require an accompanying [SHIFT] or [CONTROL] keypress on the original Atari keyboard.

Of course, every IBM keyboard comes with a numeric keypad. Transkey fully supports this too, either in numeric or cursor positioning mode, as controlled by the NUM- LOCK key. And this keypad will work with virtually any software, unlike Atari's CX85 keypad, which plugs into a joystick port, and requires a special handler not compatible with most word processing programs.

Adding an IBM keyboard to any Atari can vastly improve your typing.

Function Keys

To enhance programming speed, the Transkey has predefined the IBM keyboard's function keys F1 through F8. In one mode, each function key press outputs a BASIC command, such as POKE or SAVE "D: (allowing you to enter the rest of the filename). In the MAC/65 mode, the commands are specific to this cartridge-based assembler, such as ASM,#-,#D: and so on. The function keys F9, F10, F11, and F12 are START, SELECT, OPTION, and HELP keys respectively. (Note that F11 and F12 are available only on enhanced IBM keyboards. If you employ an XT keyboard, it will be necessary to use the computer's console key for OPTION.)

Combining CONTROL with function key presses, you can adjust certain operating modes of the Transkey and special features of the computer. CONTROL-F1 disables and enables the keyboard, both the IBM and the original.

CONTROL-F2 toggles DMA (direct memory access). When you turn DMA off you shut off the ANTIC chip, which frequently accesses computer memory for the screen display. This turns off the screen and speeds up any currently running program hy approximately 30 percent. This is useful for number crunching programs, such as ray tracers.

CONTROL-F3 toggles the audio keyboard click sound off and on. On the XL and XE computers, CONTROL-F4 toggles between two built-in character sets. One set is for character graphics and the other contains international characters used in representing some foreign languages. These fonts are availahle only on the XL/XE computers. CONTROL-F4 will have no effect on 400/800 systems.

CONTROL-F5 acts as the [HELP] key found on XL and XE systems. CONTROL-F6 is the reverse video key. CONTROL-F7 toggles between the BASIC and Mac/65 macro definitions for the function keys.

Great ESCape, BREAKing Away

The ESCAPE key is at the far top left of IBM keyboards, a somewhat inconvenient position for Atarians accustomed to having [ESCAPE] just to the left of the numher [1] key. On the IBM keyboard, the key in that position is the grave (') character, not used on the Atari. Therefore, Transkey maps this IBM key to [ESCAPE] as well, giving you two [ESCAPE] keys.

CONTROL-SCROLL LOCK acts as the [BREAK] key for the Atari on the IBM keyboard. However, on the IBM computer, the key labeled PAUSE/BREAK is usually used as the break key, in a CONTROL-PAUSE key combination. If you are accustomed to using the standard break method on an IBM computer, this might be a little annoying at first on the Atari. To reset an IBM computer, you press the CONTROL-ALT-DEL keys simultaneously. Transkey makes this the [RESET] for the Atari computer, as well.

Test Results

I tested the Transkey with AtariWriter 80, and it worked flawlessly. The screen editing is a bit cumber-

some, however, because AtariWriter uses the console keys in a way that most other programs use [CONTROL] key combinations. For example, [OPTION]-[=] is the Page Up command in AtariWriter. Transkey docs not map Page-Up to an equivalent [OPTION]-[=] key combination. Therefore, you must use F11 plus = to perform a Page Up in AtariWriter, or use the [OPTION] key on the original keyboard for this function. Similar limitations may be experienced with other word processors as well.

Transkey seamlessly integrates an IBM PC keyboard into your Atari computer. IBM PC keyboards can be had for as little as $40 by mail order, so the total upgrade cost will be around $100. The keyboard works best with Atari BASIC, Mac/65, and other programming languages. It is still quite useful when it comes to word processing, with only minor limitations. It would have been nice if Transkey had "programmable macros" for the function and editing keys, so that one could create a custom configuration for any application. However, such a feature would have made Transkey a lot more expensive. Micro Solutions has an excellent product in Transkey, and I highly recommend it.

TRANSKEY

Solder-in version	$48
Plug-in version	$58
Shipping & handling	$ 3

Micro Solutions, Box 750396, Petaluma, CA 94975. (707) 763-9103.

AVUE

Power without Programming

Review by Chester Cox

AVUE, the Analog Visual Utility Environment, offers new ways of getting to those marvelous graphics and sounds hidden inside our Ataris. It even offers programming — without programming.

Norman Thornton's AVUE package actually consists of several programs. Foremost is Pather, the actual programming language. It accesses graphics, colors, sound and movement at a rate comparable to machine language. Despite its power, Pather is a simple, straightforward programming language. With commands such as MASK (masks a portion of code as a value or a graphic) and BUCKET (a "bucket of color" from your favorite input device or devices), coding in Pather can be something of an entertaining game in itself. Even a casual programmer will be able to make exciting displays.

A compiled language, Pather lets you type your program in a word processor and save it as an ASCII file, or you can type it in BASIC. AVUE also includes UFORMS, a program which will actually help you write Pather programs, even if you've never programmed before. I don't program myself, yet I've doodled around with this program and come up with some colorful (and *noisy!*) nonsense. The TRACY program doesn't seem to operate as stated in the manual. When I tried to save a traced TRACY picture, I got a frequent ERROR 144 message. (This was an early version of AVUE, and perhaps these problems have already been addressed.)

Coding in Pather can be something of an entertaining game in itself.

The manual comes in an inexpensive three-ring binder that nonetheless looks quite classy, with section tabs on the pages. The writing style is friendly and helpful, but the manual doesn't have an index, and more examples would have been helpful. There are some errors which can slow you down. For example, the instructions tell you to RUN "D:UFORMS.MAK", but the program is actually in LISTed form, so you have to ENTER it before RUNning.

Even with these flaws, the package is hard to fault. An audio patch cord makes a delightful bonus, and the manual provides ideas on how to use it to create new input devices. I hooked it up to my stereo to make crazy musical color patterns. There's plenty of potential in this gadget — imagine hooking this up to an exercise bike and a racing game on your Atari, so the faster you go, the faster your player goes.

AVUE can't replace real programming skills, but it can make accessing your Atari simpler and more enjoyable for non-programmers. I've been bitten — despite my antipathy towards programming, I continue to play around with AVUE. Perhaps I'll never write a truly useful bit of code, but I'll have fun along the way.

AVUE $30
EXIT, 6411 6th St. NW, Washington, DC 20012. (703) 441-1525.

CSS BLACK BOX

Hard drive interface for your 8-bit

Review by Theodore DiVito

I became interested in Computer Software Services' Black Box recently when a friend bought one. I had put in a hard disk of my own not long before, using a Multi I/O board (MIO) from ICD as an interface. The MIO can be hard to find, though they're still available direct from ICD. The MIO offers either 256K or 1 megabye of RAM which can be partitioned into multiple RAMdisks, one printer spooler, a SCSI/SASI hard disk interface, a modem ►

interface, and a printer interface. This multi-purpose Input-Output device hooks up to the parallel bus on the XL. On an XE it requires an adaptor card for the enhanced cartridge port. The MIO works well with generic IBM hard drives, and I have used it with an Adaptec 4070 RLL hard drive controller, with several brand-name hard drives.

The MIO has some disadvantages, among them its pin structures. Hooking up a 50-pin cable to the hard disk port on the MIO can be difficult, and if you're not careful you can easily break off a pin. The MIO does nothing to enhance floppy I/O, either. Although it has a built-in hardware menu that lets you control the CIO channels, re-arranging device numbers in the process, it has no special handlers to speed the flow of data from hard drives or floppies. An MIO with 256K costs around $240 (prices fluctuate due to the changing prices of RAM chips).

My friend's Black Box had some impressive features, especially its ability to format hard drives in QUAD density (512 bytes per sector) as opposed to the normal density provided by the MIO. My friend's 30Mb hard drive now had 38Mb. The Black Box also has ultra-speed I/O on all secondary storage devices and allows interleave settings on hard drives to boost their read times. A built-in monitor allows you to dissect any program in assembly language. The Black Box also sports a screen-dump button and a cold-boot button, both very useful trinkets. Another neat item about the Black Box is that you can boot as many as 96 boot-disks off a hard drive. This is a real advantage over the MIO, which only lets you boot about one boot-disk using its RAM.

CSS promises some upgrades for the Black Box, including interfaces for Atari XF551 floppy drives and for IBM/ST floppy drives. Both the MIO and the Black Box allow modem rates up to 19,200 baud.

Some of the chief disadvantages of the Black Box lie in its architecture. A T-shaped card, the Box is BIG, about 2.5 times the size of an MIO, and it comes with neither case nor RAM. These items are extra and cost considerably more. If you decide to add RAM, you'll be limited to 64K, which can be used as a printer spooler.

The Black Box offers faster speeds and higher-density formats for your hard disk.

However, for those who don't really care about the RAM or a case, the Black Box does have some well-designed cable connections. For hard drives, the Black Box uses clip-pin drive connectors, providing a secure connection unlikely to break under stress (unlike the MIO, which has bare, exposed pins). XE owners will appreciate the fact than an XE adaptor is built right in, and costs nothing extra. I didn't like the printer and modem cable connectors, which are non-standard ribbon cards. However, it is easy to build inexpensive cables for those connectors.

I can recommend both interfaces to any 8-bit owner. Each has its advantages and drawbacks. The MIO has been around a while, proving to be a generally rugged, sound investment. It doesn't offer all the extra frills of the Black Box, but it does come with a case and a minimum 256K of RAM. The Black Box, on the other hand, offers lots of added features, but lacks the case, RAM, and standard printer/modem connectors unless you pay a lot more.

Both interfaces come with well-written, informative manuals. As is the case with so many 8-bit products these days, neither is widely available except through the manufacturers, who are also the only sources for repairs (to my knowledge). The MIO has the advantage of being a known quantity, a tested, integrated system that is ready to go with all you need for a hard drive setup. The Black Box offers extras like faster speeds and higher density formats for your hard disk, though you may find yourself paying more than you planned if you decide you need that case and RAM. CSS promises future enhancements to the Black Box, and I'm looking forward to seeing how they work.

MIO with 256K	$239.95
MIO with 1 Mb (if available)	$469.95
MIO XE adapter	$ 19.95

ICD, Inc., 1220 Rock Street, Rockford, IL 61101. (815) 968-228, BBS (815) 968-2229. (Prices may vary due to fluctuations in cost of RAM chips.)

BLACK BOX (bare board)	$199.95
BLACK BOX (64K RAM)	$249.95
BLACK BOX CASE	$ 39.95

Computer Software Services, P.O. Box 17660, Rochester, NY 14617. (716) 586-5545. BBS (716) 247-7157. ■

Chester Cox is a U.S. Air Force Sergeant who is an active 8-bit supporter and has written many ANTIC reviews.

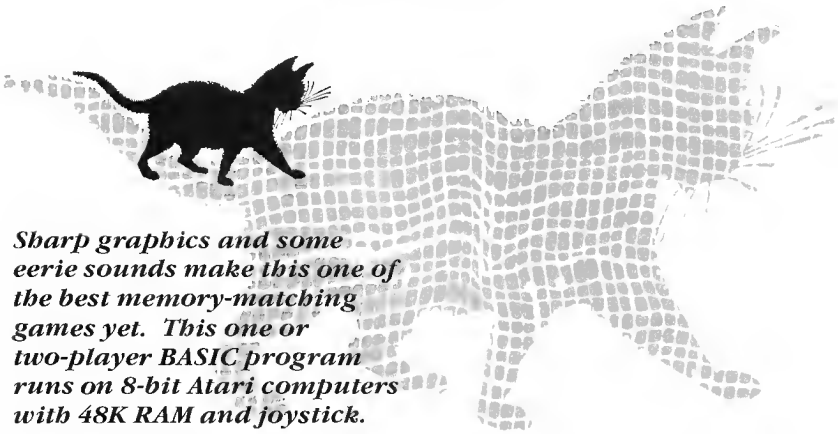
Theodore DiVito is studying Astrophysics at the University of Maryland. He has written several 8-bit Atari astrophotography programs.

Matthew Ratcliff is a St. Louis engineer who has long been one of the 8-bit Atari's best known programmers, hardware hackers and reviewers.

MONSTER MATCH

Spooky Matching Game For Halloween Fun

BY JOE BRZUSZEK



Sharp graphics and some eerie sounds make this one of the best memory-matching games yet. This one or two-player BASIC program runs on 8-bit Atari computers with 48K RAM and joystick.

Monster Match is yet another computerized card-matching game of the sort known as Concentration or "Husker Du?" (Danish for "Do you remember?"). This time, however, the images you match are all monsters, or other familiar Halloween objects. Each image comes with an appropriate — sometimes funny — sound effect. The snake hisses, the black cat yowls, and ghosts moan as you hunt for their matching cards.

Getting Started

Type in Listing 1, MONSTER.BAS, check it with TYPO II, and SAVE a copy to disk before you RUN it. If you have trouble typing the special characters in lines 8020, 8250, and 9005 through 9190, don't type these lines. Instead, type in Listing 2. When RUN, this program creates these hard-to-type lines and stores them in a file called LINES.LST. To merge the two programs, type NEW, then LOAD "D:QUIZZER.BAS" and then ENTER "D:LINES.LST". Be sure to SAVE the completed version of the program.

For a one-player game, you'll need a joystick plugged the first joystick port. Plug another joystick into the second port for a two-player game. When the game begins, press [SELECT] to choose the number of players. You can also turn the sound effects on or off by pressing [OPTION]. These amusing effects add a lot to the game — but it does run faster with the sound off. Press [START] to begin play.

The program shuffles a deck of 36 cards, and lays them face down on the screen. With the joystick, move the pointer to the card you want and press [FIRE] to turn the card over. Then see if you can pick the matching card from the deck. If you do, the matched cards are removed from the board, and you get to pick again. If you fail to make a match in a two-player game, the turn passes to the other player. The goal is to match all the cards in the least number of turns, beating your opponent, if any. In two-player

continued on page 106

WINDOWS ON YOUR ATARI

Program Your Own Graphic User Interface

BY JEFFREY SUMMERS, MD

The fast machine language routines in this neat little demo make it easy and practical for intermediate (and advanced beginner) Atari BASIC programmers to use windows in their own 8-bit programs.

The latest fashion in "user interfaces" (how you work with your computer) is the Graphic User Interface, or GUI (pronounced gooey). Computers such as the Apple Macintosh, Atari ST, and Commodore Amiga have had this type of interface for years, using windows, icons and drop-down menus to make computing easier. Recently, IBM users have been climbing onto the bandwagon with programs such as Microsoft Windows and Digital Research's GEM. The 8-bit Atari recently gained access to such a system with the Diamond operating system from Reeve Software. However, there hasn't been much that a beginning-to-intermediate BASIC programmer could do to get this kind of fancy display.

Atari Windows makes it fairly simple for users to create windows. Text under the window is saved when the window is opened, and restored when the window is closed. Text written to the window will be erased when the window is closed. Windows can also be cleaned (their contents erased) without clearing the entire screen. The routines here work well only with regular "Graphics 0"text screens, but windows are usually used in applications programs where this should not be a problem.

Getting Storted

Type in Listing I, WINDDEMO.BAS, check it with TYPO II, and SAVE a copy to disk before you RUN it. If you have trouble typing the special characters in lines 10020 through 10100, don't type these lines. Instead, type in Listing 2. When RUN, this program creates these hard-to-type lines and stores them in a file called LINES.LST. To merge the two programs, type NEW, then LOAD "D:WINDDEMO.BAS" and then ENTER "D:LINES.LST". Be sure to SAVE the completed version of the program.

You can simply RUN "D:WINDDEMO.BAS" to see Atari Windows in action, but to really appreciate how it works you should have a text-filled screen for a background. One way to do this is to LOAD "D:WINDDEMO.BAS", LIST the program on the screen, and then RUN it. A series of five windows will open on the screen, each with its own little message. Then the windows will close again, one at a time, revealing the windows and text underneath them still intact! (Note that the cursor will be in the middle of the screen, where the last PRINT statement left it.)

In fact, the screen data "behind" each window is stored in memory, and only restored just as the window closes. There is no limit to the number of windows that can be open at one time, hut there is a practical limit to the amount of screen information the array used for storage can hold. Currently, this is set to 5000 bytes, which is enough to hold the entire screen being windowed five times — much more than you are likely to use. If you actually need more, simply increase the size of WINDOW$ in line 10010.

Window Routines

Four routines handle the windows: WINDOI, WINDOO, WINDOC, and WINDEX. WINDOI sets everything up for the other routines to use. WINDOO opens windows, WINDOC closes them, and WINDEX cleans them (of course!).

Before trying to do anything with windows, your program should perform a GOSUB 10000. The routine at 10000 takes care of all the setup and calls WINDOI, so you should never actually have to use WINDOI.

WINDOO opens a window. The routine has four parameters: the left column, upper row, right column, and lower row of the window you ►

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The **Black Box** is a device for your XL or 130XE computer that adds the ability to plug a mouse to your 8-bit Atari. It has two ports, two switches, and a set of dip switches visible from the outside. It plugs directly into the back of the 600XL 800XL, and 130XE computers. Custom cases may be an optional expense. The **Black Box** performs three main tasks: Interface to a SASI/SCSI bus device (hard disks), Parallel printer port, and a RS232 port. A fourth option available soon, will be a floppy disk port, especially useful to XF-551 owners. The SASI/SCSI port provides the necessary signals for hooking up most common hard disks. You may partition your hard disk into as many drives as you with, up to 9 can be accessed of of time. By pressing one of the buttons on the **Black Box** you will enter the configuration menu, where you can re-assign drive numbers, etc. When you exit, you will be right back in the program you were running when the switch was pressed. Each hard disk can be write-protected. The Parallel Printer port will allow you to hook up any printer that uses the standard Centronics Interface. As an option you can use the computer's extra memory as a printer buffer or order the **Black Box** with 64K of on-board RAM. You may assign printer number and line-feed options within the menu (for use with multiple printers). Another amazing feature of the **Black Box** is the built-in screen dump. By pressing a button on the back, the contents of your screen will be dumped to your printer (you can define text or graphics modes with a switch)! The RS232 port supplies the full RS232 spec signals for connection to a modem, or another machine (for null-modeming). The handler for the **Black Box** s modem port is built in and takes up NO memory! The port handles rates up to TRUE 19.2K BAUD! A future upgrade for the **Black Box** is a floppy disk interface board. this will allow the addition of up to four 5.25" or 3.5" mixtures of floppy drives to be used with the system. The drives will all of the new 1 megabyte single/enhanced/double density disk drives, but MUCH faster! All drives will be Super Archiver compatible, and support up to 2 sides of 80 tracks. Along with the hardware upgrade will come software capable of reading, writing and formatting disks in IBM's MS-DOS format and the Atari ST format, and allow you to handles files between these disk formats and the Atari's format. In addition , a machine language monitor has been added to allow memory modification, memory/register displays, and more. The Price of the **Black Box** s $199.95 ta the basic unit and $249.95 with 64K of RAM (for printer spooler) plus $8 for S/H/I. An optional custom **BLACK BOX** case is available for $39.95 extra. The Black Box is a product of Computer Software Services. Not the Block Box Corporation!

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This device brings the power and flexibility of larger systems to your 8-bit. The **Multiplexer** is a device (actually a collection of modules) that allow up to 8 Ataris to read and write to the same drive (typically a hard disk), printer, and talk to each other. One 'master' computer (any 8-bit) is equipped with the master **Multiplexer** interface. Then up to 8 "slave" computers can hook up to the master, each having their own slave Interface. The 'common' peripherals (things that are to be shared) are connected to the master computer. On each drive, all disk and printer I/O is routed through the master, so no drives are needed on them. The master computer can be configured in any manner you wish - you can designate how certain peripherals are "local" to the slave, or routed to a different number on the master. Under development is a BBS system that will make full use of this device, allow up to 8 users to be using the system at the same time! A multiuser chat mode is a feature of this program, however, you do not NEED this program to run a BBS with the **Multiplexer** (but be warned that all BBS programs will run concurrently). All slaves are independent, and do not need to have the same program running on them. This system is excellent for BBS SysOps, because you can be using you hard disk(s) while still running you BBS uninterrupted! Another example is in a classroom situation, or anywhere a disk needs to be shared by different people. This is an EXCELLENT programming/debugging tool as well! The **Multiplexer** price is $199.95 for a master and two slave units (plus $5 S/H/I). Additional slave units are $99.95 each.

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wish to open. So, the following line:

100 D=USR(WINDOO,4,5,25,10)

opens a window that runs from columns 4 to 25 in rows five through 10. A border is drawn around the window, so be sure to make the windows large enough for the text you want.

The window doesn't really change the way you work with the screen. So, if you want to print something at a particular place within a window you would use the POSITION statement just as you would normally. To print "Hello" in the window you just created:

110 POSITION 6,7:PRINT "Hello"

Closing a window erases that window's contents and restores whatever was under the window before it opened. The WINDOC routines closes the windows, and it takes no parameters:

120 D=USR(WINDOC)

Finally, WINDEX erases the contents of the current or top window. This can be useful for asking a series of questions within a window, for example. You can keep your window open while erasing the previous question and response, and then ask another question. This is a bit neater than closing the window and re-opening it with the same dimensions, which would cause the screen contents "underneath" to flash briefly on the screen.

If the windows in the demo move too quickly or slowly for you, change the value of WAIT in line 35. Smaller values shorten the time between window changes, and larger values increase it. ■

Listing on page 113

A physician from Rochester, NY, Jeffrey Summers NY is a frequent contributor to ANTIC. His soundwave-drawing program Antic Sound Creator appeared in the December 1989 issue of ANTIC.

MONSTER MATCH

continued from page 103

games, if each player winds up holding 18 cards, the winner is the one who overturned the final pair of cards.

Programmer's Notes

The Monster Match program is quite long and complex. Some of the programming techniques used include a single machine language subroutine that moves "chunks" of memory, an ANTIC mode 4 display, five display list interrupts (DLIs), two-player images, and eighteen unique sound subroutines that begin at line 500.

The DLI initialization and data is contained in line 9005 and stored in page 6, beginning at memory location 1536. The first DLI changes two colors, as well as the starting address for the next DLI. The next four DLIs each change the value in the Character Base Register (54281, shadow at 756).

There are nineteen different card faces (including the back of the card) made up of twelve characters each. That's 19 X 12 = 228 characters needed, but there's only 128 characters available in the set. Each row, however, has only nine different cards, plus the back of the card, requiring only 120 characters per row. Taking advantage of the 8-bit Atari's wonderful DLI capability, the character set base register can be reset for each of the four rows, making it possible to represent all nineteen cards on the screen. Things get a little more complicated than that, but at least you now have a vague idea of how involved a simple program like Monster Match can be! ■

Listing on page 109

Joe Brzuszek of Monroeville, PA, is the author of Landscape Illusion in the December 1986 issue of ANTIC.

MISSILE BOMBERS

The Battle Rages From Dawn To Dusk

BY JOSEPH JIMICK

Enemy bombers are attacking, and it's up to you to stop them. This BASIC program works on any Atari 8-bit computer with a mininmum 16K and joystick.

When I wrote Missile Bombers I wanted to design an arcade-style game in Atari BASIC without using machine-language subroutines or interrupts. Instead, I used the text-mode scrolling capahility, along with a popular Player/Missile graphics trick in which the Player/Missile memory area is made to overlap an area of string memory. The result is a little slow and jerky, but is nevertheless a challenging arcade-style shoot-'em-up which requires a little bit of thinking.

As the player, you must protect your base from attacking enemy bombers. To destroy these bombers, you have a limited number of launchers capable of firing surface-to-air missiles. You must prevent falling bombs from destroying your launchers — not to mention the bombers you just shot down. These crippled bombers plummet to to the ground, crushing your launcher if it's in the way. These determined enemies fly from dawn to dusk, and it's up to you to stay on your toes and clear them from the skies.

Getting Launched

Type in Listing I, MISSBOMB.BAS, check it with TYPO II and SAVE a copy to disk before you RUN it. If you have trouble typing the special characters in lines 34 through 36, don't type these lines. Instead, type in Listing 2. When RUN, this program creates these hard-to-type lines stores them in a file called LINES.LST. To merge these lines into your program, first type NEW, then LOAD "D:MISSBOMB.BAS" and then ENTER "D:LINES.LST". Be sure to SAVE the completed version of the program.

When you RUN the program the first day of battle will begin with the rising sun. Your missile launcher moves horizontally across the bottom of your screen. Move the joystick left and right to guide the launcher, and press [FIRE] to launch a missile. You can have only one missile onscreen at a time, and as it rises steadily the missile will follow the horizontal movement of your launcher. This way, you can guide a missile to its target, as long as you're careful not to accidentally guide your launcher into a falling bomb! Your launcher moves at exactly the same speed as the planes, so plan your shots carefully. Also, note that each missile can only destroy one bomber.

The bomber attacks are divided into days. At the beginning of a day, the sun will rise to the top of the screen, and the bomber attack begins. The sun slowly sinks towards the bottom again, glowing orange as the sky darkens. Once the sun actually sets the attack is over, and the bonus for that attack will be calculated based on the day and the number of enemies destroyed during that day.

There will only ever be two flying bombers on the screen at once, hut as the days progress the number of bombs dropped increases. Eventually, the bomhs become so numerous that they appear to form two intersecting lines across the screen, falling mercilessly toward your launcher. After ahout 31 days, gaps hetween bombs will be almost nonexistent, making the game's end inevitable. I have never seen anyone survive long enough to reach that point — even with the bonus launchers awarded at the third, fifth, seventh, tenth, 13th, 17th, 21st, 26th and 31st days. ■

Listing on page 114

Joseph J. Jimick lives in Grantham, Pennsylvania. This is his first appearance in ANTIC.

TYPING SPECIAL ATARI CHARACTERS

The Atari Special Characters and the keys you must type in order to get them are shown below:

For [CONTROL] key combination, *hold down* [CONTROL] while pressing the next key. For inverse [CONTROL] [A] through [CONTROL] [Z], press the [◪] key—or [⅄] on the 400/800—then *release* it before pressing the next key. (Press [◪] or [⅄] again to turn off inverse.) For [ESC] key combinations, press [ESC] and then *release* it before pressing the next key.

Carefully study the chart above and pay close attention to differences between lookalike characters such as the slash key's [/] and the [CONTROL] [F] symbol [◪].

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
♥	CTRL ,	♣	CTRL S
♦	CTRL A	♠	CTRL T
♣	CTRL B	♥	CTRL U
♠	CTRL C	♦	CTRL V
♦	CTRL D	♣	CTRL W
♣	CTRL E	♠	CTRL X
♥	CTRL F	♦	CTRL Y
♦	CTRL G	♣	CTRL Z
♥	CTRL H	♠	ESC ESC
♦	CTRL I	♣	ESC CTRL -
♣	CTRL J	♠	ESC CTRL =
♠	CTRL K	♣	ESC CTRL +
♦	CTRL L	♠	ESC CTRL *
♥	CTRL M	♠	CTRL .
♦	CTRL N	♣	CTRL ;
♣	CTRL O	♦	SHIFT =
♠	CTRL P	♠	ESC SHIFT CLEAR
♦	CTRL Q	♦	ESC DELETE
♣	CTRL R	♦	ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS
↑	ESC SHIFT DELETE
↓	ESC SHIFT INSERT
←	ESC CTRL TAB
→	ESC SHIFT TAB
↑	⅄CTRL .
↑	⅄CTRL ;
↑	⅄SHIFT =
↖	ESC CTRL 2
↓	ESC CTRL DELETE
↓	ESC CTRL INSERT

TYPO II AUTOMATIC PROOFREADER

TYPO II automatically proofreads **Antic**'s type-in BASIC listings. Type in the listing below and SAVE a copy to disk or cassette. Now type GOTO 32000. At the prompt, type in a single program line **without the two-letter TYPO II code at the beginning**. Then press [RETURN].

Your line will reappear at the bottom of the screen. If the TYPO II code does not match the code in the magazine, then you've mistyped your line.

To call back a previously typed line, type [*], then the line number, then [RETURN]. When the completed line appears, press [RETURN] again. This is how TYPO II proofreads itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000. To remove TYPO II from your program, type LIST "D:FILENAME",0,31999, then [RETURN], then NEW, then ENTER "D:FILENAME", then [RETURN]. Now you can SAVE or LIST your program to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 AEM TYPO II BY ANDY BAATON
VM 32010 AEM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLA :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II"

EM 32050 TAAP 32040:POSITION 2,3:? "Type
   in a program line"
NS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XN 32070 IF LINE$(1,1)="*" TNEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TN 32000 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 042,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? "TYPO II"
   ":POSITTON 2,15:LIST B
CE 32130 C=0:ANS=C
QA 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" TNEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EN 32100 HCODE=INT(CODE/26)
BN 32190 LCODE=CODE-(NCODE*26)+65
NO 32200 NCODE=NCODE+65
TE 32210 POSITION 0,16:? CNA$(HCODE);CNA$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press RETURN and edit line a
   bove.":GOTO 32050
```

MONSTER MATCH

Spooky Matching Game For Halloween Fun

Article on page 103

LISTING 1

Don't type the TYPO II Codes!

```
UO 1 REM MUNSTER MATCH
UA 2 REM BY JOE O. ORZUSZEK
YP 3 REM (c)1990, RNTIC PUBLISHING, INC.
RZ 9 REM ■SHOWTIME■INPUT■
YU 10 RESTORE 9000:GOSUB 8000
RC 20 ON PEEK(20)<V0 GOTO 30:ON PEEK(20)>
   24 GOTO 25:POKE 53240,X:GOTO 30
ER 25 POKE 53240,Z:POKE 20,Z
WR 30 T=STICK(5):X=X+16*((T=7)-(T=11)):Y=
   Y+40*((T=13)-(T=14)):T1=STRIG(5):ON X3
   =X RNO Y3=Y RNO T1 GOTO 20
UH 35 IF X<>X3 OR Y<>Y3 THEN POKE 53279,Z

YZ 40 IF Y<103 THEN Y=103
OO 50 IF Y>223 THEN Y=223
01 60 IF X<50 THEN X=50
MC 70 IF X>106 THEN X=106
LI 80 T=USR(ADR(MM$),ADR("▼▼▼▼▼▼"),P1+Y3,
   5):POKE 53248,X:T=USR(ADR(MM$),ADR(PL$
   ),P1+Y,6):X3=X:Y3=Y
ST 90 ON PEEK(53252) AND  NOT T1 GOTO 100
   :GOTO 20
RY 99 REM ■A CARD IS SELECTED■
XR 100 SOUND Z,V0,V0,V10:SOUND Z,Z,Z,Z:X1
   =(X-50)/V4+V2:Y1=0.125*(Y-103)+5:K=X1/
   V4+0.5+(Y1/5-V1)*9
ES 110 POKE 77,Z:I2=ASC(MIX$(K)):I=K*V12-
   11:POKE 53240,Z:IF MIX$(K,K)=" " THEN
   20
HM 120 POSITION X1,Y1:FOR J=Z TO 9 STEP 3
   :POKE 766,V1:? CARD$(I+J,I+J+V2);:POKE
    766,Z:? "▀▀▀▀";:NEXT J
KN 130 TN=TN+V1:IF TN=V2 RNO K1=K THEN TN
   =V1:GOTO 20
U0 135 IF  NOT SO THEN FOR L=Z TO 50:NEXT
    L:GOSUB 500+I2*20
J0 140 IF TN=V1 THEN K1=K:I1=I2:X2=X1:Y2=
   Y1:GOTO 20
XJ 150 N=N+V1:TN=Z:IF I1=I2 THEN 300
OK 100 FOR J=Z TO 300:NEXT J:POSITION X2,
   Y2:? C1$:POSITION X1,Y1:? C1$:ON  NOT
   PL GOTO 20:S=S+V1
ZS 190 IF S=V2 THEN S=Z:POKE 53249,56:POK
   E 704,204:GOTO 20
JV 200 POKE 53249,144:POKE 704,106:GOTO 2
   0
YF 299 REM ■A MATCH IS MADE!■
SF 300 RESTORE :MIX$(K,K)=" "":MIX$(K1,K1)
   =" "":FOR I=Z TO V2:FOR K=170 TO 160 ST
   EP -V1:POKE 705,K
FJ 310 SOUND Z,K-100,V10,V4:NEXT K:FOR K=
   160 TO 170:POKE 705,K:SOUND Z,K-100,V1
   0,V4:NEXT K:NEXT I
GL 320 TOUNT Z,Z,Z,Z:FOR K=Z TO 30:NEXT K
   :S1=S1+V2:S$=STR$(S1):IF S THEN S2=S2+
   V2:S1=S1-V2:S$=STR$(S2)
XV 330 TRAP 334:S$(V1,V1)=CHR$(ASC(S$(V1)
   )+128):S$(V2)=CHR$(ASC(S$(V2))+128)
RI 334 IF  NOT S THEN POSITION 12,V2:? S$

A0 335 IF S THEN POSITION 34,V2:? S$
PN 340 FOR I=Z TO 300:NEXT I:POSITION X1,
   Y1:? "  ▀▀▀▀▀  ▀▀▀▀▀  ▀▀▀▀▀  ";
QS 350 POSITION X2,Y2:? "  ▀▀▀▀▀  ▀▀▀▀▀
   ▀▀▀▀▀ ";:IF S1+S2<36 THEN 20
FM 355 POKE 53249,56:IF S2>S1 THEN POKE 5
   3249,144
YY 359 REM ■THE GAME IS OVER■
GJ 360 I=254:J=I:FOR H=V1 TO 6:FOR I=I TO
    I-40 STEP -V2:POKE 705,I:SOUND Z,I,V0
   ,V0:NEXT I
CT 362 FOR J=J TO J-40 STEP -V2:POKE 705,
   J:SOUND Z,J,V2,14:NEXT J:NEXT H:SOUND
   Z,Z,Z,Z:POKE 53249,Z
DR 370 POSITION V1,Z:? "■CONGRATULATIONS■
   ■■■■■■■■■!? "■YOU FIND■ME■AFTER ";N;"
   ■TURNS■ PRESS■■■■■";
DR 300 ? "■START FOR A NEW GAME■■■■■■■■■
   ■■■■■"
QS 390 ON PEEK(53279)=7 GOTO 390:POKE 559
   ,Z:P=P/256:P=P-V0:GOSUB 8030:GOTO 20
MI 490 REM ■SOUND ROUTINES■
YZ 499 REM ■BRITZ■ HOLDER■
LL 500 FOR J=V12 TO Z STEP -V2:FOR H=V12
   TO Z STEP -V1:SOUND Z,H/V4,V4,J:NEXT H
   :NEXT J:SOUND Z,Z,Z,Z:RETURN
PL 519 REM ■DECREMENT■
V5 520 FOR H=Z TO 5:FOR J=25 TO 40 STEP V
   4:SOUND Z,J,V10,6:NEXT J:FOR J=35 TO 2
   5 STEP -V4
NH 530 SOUND Z,J,V10,6:SOUND Z,V0,V0,V2:N
   EXT J:SOUND Z,Z,Z,Z:FOR L=Z TO 90:NEXT
    L:NEXT H:RETURN
IX 539 REM ■BELL■
XI 540 FOR H=Z TO V12:FOR J=Z TO V2:SOUND
    Z,V10,V0,6+J:NEXT J:SOUND Z,Z,Z,Z
ES 545 FOR J=Z TO RNO(Z)*V2:NEXT J:NEXT H
   :RETURN
TR 559 REM ■SIREN■
ZQ 560 FOR J=V10 TO 30 STEP V4:FOR H=Z TO
    V12 STEP 20/J:SOUND Z,J*V4,V2,H:NEXT
   H:NEXT J:SOUND Z,Z,Z,Z
ZP 570 RETURN
P0 579 REM ■EXPLOSION■
YT 580 FOR J=V12 TO Z STEP -0.4:SOUND Z,V
   4+RND(Z)*V0,V2,J:FOR H=Z TO V4:NEXT H:
   SOUND Z,Z,Z,Z:NEXT J:RETURN
0G 599 REM ■BUZZARD■
MI 600 FOR H=Z TO V2:SOUND Z,60,V10,V12:F
   OR J=Z TO 20:NEXT J:SOUND Z,Z,Z,Z:NEXT
   H

JX 610 FOR J=V12 TO Z STEP -0.4:SOUND Z,6
   0,V10,J:SOUND V1,45,V10,J:SOUND V2,76,
   V10,J:SOUND 3,91,V10,J:NEXT J:RETURN
RQ 619 REM ■LAUGH OR GROAN■
U5 620 FOR J=Z TO V0 STEP 0.5:SOUND Z,V0+
   RND(Z)*20,V0,J+RND(Z)*V2:NEXT J:FOR J=
   Z TO 5 STEP -0.5

GR 630 SOUND Z,V0+RND(Z)*40,V0,J+RND(Z)*V
   2:NEXT J:SOUND Z,Z,Z,Z:RETURN
VH 639 REM ■CRYPT KEEPER■
OT 640 RESTORE 640:TRAP 650
RN 645 READ J,H,L:SOUND Z,J,V10,V0:SOUND
   V1,H,V10,6:FOR T=Z TO 30:NEXT T:IF L T
   HEN SOUND Z,Z,Z,Z
SM 646 IF J=121 AND H=Z THEN SOUND Z,114,
   V10,V0:SOUND V1,Z,Z,Z
SM 647 GOTO 645
QU 648 ORTR 136,102,0,144,102,1,136,173,1
   ,144,0,1,136,182,0,144
ER 649 ORTR 182,1,144,173,1,121,0,1,121,1
   82,1,136,102,1,136,173,1
UK 650 SOUND Z,Z,Z,Z:SOUND V1,Z,Z,Z:RETUR
   N :DATA 136,173,1,136,102,0,136,102,0,
   136,173,0,136,173,0,F
CV 659 REM ■SOUND■
CR 660 RESTORE 670:TRAP 670
0Q 665 READ J:FOR N=V10 TO Z STEP -1.6:SO
   UND Z,J,V10,N:NEXT H:GOTO 665
XN 670 SOUND Z,Z,Z,Z:RETURN :DATA 243,217
   ,193,217,193,102,193,102,162,102,162,1
   44,162,144,128,144,120,121,F
```

```
CD 679 REM ■GHOST■
OI 680 FOR J=102 TO 144 STEP -U4:FOR N=V4
   TO U12 STEP V4:SOUND Z,J,U10,H:NEXT H
   :FOR H=U12 TO U4 STEP -U4
LL 685 SOUND Z,J,U10,N:NEXT H:NEXT J:FOR
   J=144 TO 102 STEP V4:FOR H=U4 TU U12 S
   TEP U4:SOUND Z,J,U10,H:NEXT H
NW 690 FOR H=U12 TO U4 STEP -U4:SOUND Z,J
   ,U10,H:NEXT N:NEXT J:SOUND Z,Z,Z,Z:RET
   URN
YQ 699 REM ■BLACK CAT■
TM 700 FOR J=5 TO 22:SOUND Z,J,U2,7+J/3:N
   EXT J:FOR J=22 TO 15 STEP -U1:SOUND Z,
   J,U2,7+J/3:NEXT J:SUUND Z,Z,Z,Z
ZF 710 RETURN
MU 719 REM ■HELICOPTER/CANCERN■
GI 720 FOR H=10 TU 150 STEP V10:FOR J=H T
   O N+50 STEP 20:SOUND Z,J,U10,U10:SOUND
    U1,J-U1,U10,U0:NEXT J:NEXT H
QP 730 SOUNO Z,Z,Z,Z:SOVNO U1,Z,Z,Z:RETUR
   N
XQ 739 REM ■RIDE■
00 740 RESTURE 750:TRRP 750
CN 745 READ J:FOR H=U10 TO Z STEP -V2:SOU
   ND Z,J,U10,N:NEXT H:GOTO 745
0V 750 AETURN :DATA 9,14,9,14,9,F
LG 759 AEM ■FRENCH-FRENCH■
LY 760 FOR H=U12 TO Z STEP -0.2:SOUND Z,1
   53,U12,H:SOUND U1,154,12,H:NEXT H:RETU
   RN
QO 779 REM ■QUIEN■
OE 780 FOR J=U12 TU Z STEP -0.6:SOUND Z,1
   0,U10,J:FOR H=Z TO V2:NEXT H:SUUND Z,2
   30,U10,J:FOR H=Z TU V10:NEXT N:NEXT J
ZU 790 RETURN
LR 799 REM ■ROZZ CAGE■
0U 800 FOR J=15 TO Z STEP -0.5:SOUND Z,14
   0,V2,U12:FOR H=U1 TO U1:NEXT H:SOUND Z
   ,Z,Z,U12:NEXT J:SOUND Z,Z,Z,Z:RETURN
QJ 819 REM ■SIREN■
OT 820 FOR J=Z TO U12 STEP 0.2:SOUND Z,Z,
   U0,J:NEXT J:FOR N=Z TU 50:NEXT H:FVR H
   =U12 TU U0 STEP -0.2
HP 830 FOR J=H TO N-U0 STEP -U2:SUUND Z,Z
   ,V0,J:NEXT J:NEXT N:SOUND Z,Z,Z,Z:RETU
   RN
PG 839 REM ■GREEDIAN■
MS 840 FOR J=U0 TV 15 STEP 0.8:SOUND Z,13
   0+AND(Z>*U12,V2,J:NEXT J:FOR J=15 TU Z
    STEP -0.5
XJ 845 SOUND Z,140+RND(Z)*U12,U2,J
NI 850 NEXT J:RETURN
E0 7999 REM ■INTRODUCTION■
IJ 8000 READ U1,U2,U4,U0,V10,U12:P=PEEK(1
   06)-24:POKE 106,P:DIM MM$(63),PL$(9),C
   ARO$(432),MIX$(36),C1$(20),S$(2)
JH 8010 GRAPHICS 2:POKE 559,Z:OL=PEEK(560
   )+PEEK(561)*256:PUKE 54279,P:P1=P*256+
   1024
JN 8019 REM ■INTRO DELAY FOR SOUNDTRACK■
AC 8020 MM$="hhhhhhhhhhhhhhhhhhhhhhhhhhhh
   hhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhh
   hhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhh
   hhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhh
GG 8030 CARO$="■":CARO$(432)="■":CARO$(V2
   )=CARO$:FUR X=Z TO 31:Y=USR(ADR(MM$),A
   DR(CARO$),P1+X*432,LEN(CARO$)):NEXT X
UN 8050 POKE 53248,Z:POKE 53249,Z:POKE 54
   206,64:PUKE DL+7,130:FOR X=U0 TU 20:PU
   KE UL+X,7:NEXT X
JK 8060 RESTURE 9005:READ CARO$:Y=USR(ADR
   (MM$),ADR(CARO$),1536,LEN(CARO$)):Y=US
   R(1536)
Z5 8070 PUKE 02,Z:POKE 752,V1:POKE 700,60
   :PUKE 709,Z:POKE 710,U10:PUKE 711,102:
   ? "■";:FOR X=Z TU 120:? "■";:NEXT X
WC 8071 POSITIUN 13,Z:? "■■■■■■■■■■■■■■■■
   ■■■■■■■■■■■■■■■■■■■■■■
```

```
JY 9000 DATA ▒▒▒
```

```
TW 1290 DATA 04005404003206806500406503212012012012
```

WINDOWS ON YOUR ATARI

Program Your Own Graphic User Interface

Article on page 104

Don't type the TYPO II Codes!

LISTING 1

```
DH 10 AEM WINDOW DEMO
QX 20 AEM BY JEFFAEY SUMMEAS
LJ 25 REM (c) 1990, ANTIC PUBLISHING,INC.
MB 30 GOSUB 10000
PT 35 WAIT=1000
UE 40 D=USR(WINDOO,5,5,35,20):POSITION 0,
   10:PRINT "This is window number one."
BS 50 FOA I=1 TO WAIT:NEXT I:AEM delay
QW 60 D=USR(WINDOO,7,7,37,15):POSITION 10
   ,10:PAINT "This is window number two."

FE 70 FOA I=1 TO WAIT:NEXT I
QN 80 D=USR(WINDOO,9,9,30,12):POSITION 11
   ,11:PRINT "This is window number 3."
FG 90 FOA I=1 TO WAIT:NEXT I
NH 100 D=USA(WINDOO,3,3,30,22):POSITION 7
   ,11:PAINT "This is window number 4."
QC 110 FOA I=1 TD WAIT:NEXT I
DS 120 D=USA(WINDOO,10,5,21,21):POSITION
   11,12:PAINT "This is #5"
QG 130 FOA I=1 TO WAIT:NEXT I
OE 140 FOA J=1 TO 5
BY 150 D=USA(WINDOC):FDA I=1 TD WAIT:NEXT
   I
GN 160 NEXT J
OE 170 END
CA 10000 AEM WINDOWS INITIALIZATION
JD 10010 DIM WINDOW$(5000),WINDOI$(10),WI
   NDOO$(244),WINDOC$(155),WINDEX$(149)
KH 10020 WINDOI$(1,10)="hh▼ZhhV▼Z@"
DR 10030 WINDOO$(1,90)="hhhXOOhhhXOOhhhXO
   hhOZ▼OOZ▼OEETZOO▼i<OOZ▼i▼OETZOO▼i<OOZ▼i
   ▼ZhhV▼ZhhIQ▼SKYOO▼Z▼OOTO▼"
FH 10040 WINDOO$(91,160)="PTBAQ▼OOPEJ▼OJT
   ZPEJA▼Z▼ZRIU▼▼ZRSNA▼iPNJOO▼i▼OEIUPEPSNA
   IIUOZ▼EYPEIDOUEOPEICOUOZ▼i<"
BZ 10050 WINDOO$(161,240)="▼OUZ▼i▼OETZEOO▼
   ITOEIUPEPEJZ▼ZRSNA▼ZRSNA▼ZRSNA▼ZRSNA▼
   ZRSNA▼ZRSNA▼ZRSNA▼Z▼ZRIU▼▼"
GO 10060 WINDOO$(241,244)="▼ZRA▼"
FK 10070 WINDOC$(1,80)="h▼OOR▼ZRSNA▼ZRSNA▼
   ZRSNA▼ZRSNA▼ZRSNA▼ZRSNA▼ZRSNA
```

```
WU 1160 DATA 165009133215190212165214024105040133214034155049040040056040032007073070060079067136040056049
LX 1170 DATA 044049053053040186103416525151050001332151652122010002002351652171332121660001772201642135145214
GO 1180 DATA 165220024105001133220165221105000133221196210240005230213024144226165212197219240022302121465
VO 1190 DATA 214024105040133234165215105001332151652161331230214414190096034155049040040057040032007073070
WF 1200 DATA 060069000036040049044056041006104104173000006056233006133220173001006233000133221160000177
OP 1210 DATA 220170202134219200177220170202134219200177220170202134219200177220170232134217134212200177220170232134216134213200
OH 1220 DATA 177220170232134216134213200177220170232134216134213200177220170232134216134213200177220170232134216134213200
CF 1230 DATA 155049040040049044040032070730700606900003604005604904404905205704106103413321516521220100020
XM 1240 DATA 235165214713321216900016421314521416522002410500113320165221105000133221196210240005230213024
WG 1250 DATA 144220165212197219240022302121652104105040133214165215105000133215165216133213024144200096
SU 1260 DATA 034155
```

MISSILE BOMBERS

The Battle Rages From Dawn To Dusk

Article on page 107

LISTING 1

Don't type the TYPO II Codes!

```
CP  1 REM ■DISPLAY LIST■
HJ  2 REM ■ANTIC SOFTWARE■
VP  3 REM (C)1990, ANTIC PUBLISHING, INC.
VL 10 GOSUB 80:GOSUB 40:GOSUB 41:GOSUB 27:GOSUB 33:GOSUB 32:GOTO 93
NO 11 A=PEEK(632):0=0:0=A(A)):POKE 77,0:M=E(M-3):N=H(N+3):POKE 53277,3:POKE 532
   77,7
ZG 12 IF 00)=80 THEN POKE 711,61
IN 13 F=D(E,F-4):F$(F)=L$:IF F=103 THEN E=0
WU 14 POKE 84,1:POKE 85,1:? "■";:IF PEEK(644)=0 AND F=103 THEN E=1:Q=10
AC 15 POKE 53240,0:PUKE 53249,0:POKE 53250,N:POKE 53251,M:ON (PEEK(53261)<>0 AND PEEK(53261)<>1) GOSUB 19
XK 16 POKE 53270,1:P=P-2*(P)0):Q=Q-0.5*(P>0):SOUND 0,5,0,0:SOUND 1,35,0,P*(P>0):ON (PEEK(53252)<>0) GOTO 53
MF 17 COLOR J(RND(0)*20):PLOT K(M)*(M)40 AND M<200),L:COLOR J(RND(0)*20)
E0 18 PLOT K(N)*(N)48 AND N<200),K:00=00+0.2:D$(0D)=N$:DN (00=05) GOTO 72:GOTO 11
YU 19 P=15:00=00+10:W=W+08:8F=8F+1:Q=0
LV 20 POKE 84,0:POKE 85,2:? "SCORE: ";W:IF PEEK(53262)<>0 THEN 24
R0 21 POKE 53251,210:H$=C$
PD 22 IF K(M)>1 AND K(M)<38 THEN POKE 85,K(M):POKE 84,L:? "■";:POKE 85,K(M)-1:POKE 84,L+1:? "■■";
XD 23 I=RND(0)*60+20:L=(I/4.2003)-2:H$(I)=K$:M=210:E=0:F=103:F$=C$:RETURN
YO 24 POKE 53250,40:G$=C$
PD 25 IF K(N)>1 AND K(N)<38 THEN POKE 85,K(N):POKE 84,K:? "■";:POKE 85,K(N)-1:POKE 84,K+1:? "■■";
U0 26 J=RND(0)*60+20:K=(J/4.2003)-2:G$(J)=J$:N=48:F=103:F$=C$:E=0:RETURN
KN 27 GRAPHICS 0:DIM A$(1),B$(INT(ADR(A$)/1B24)+1)*1024-ROR(A$)-1),C$(304)
NI 28 DIM D$(120),E$(120),F$(128),G$(120),H$(120)
OM 29 C$="■":C$(384)="■":C$(2)=C$:D$=C$:E$=C$:F$=C$:G$=C$:H$=C$
SZ 30 POKE 54279,RDR(C$)/256:POKE 559,46:POKE 53277,3
ZV 31 RETURN
VD 32 POKE 704,71:POKE 53240,120:PUKE 82,0:POKE 752,1:POKE 705,0:POKE 706,130:POKE 707,130:POKE 711,223:RETURN
ZM 33 DIM I$(8),J$(0),K$(8),L$(12),M$(140),N$(10),O$(10)
KO 34 I$="$$<$(ZD■":J$="■■■■D■■■":K$="■■■■D■■■":L$="■■■■<<<$■■■■":N$="■(((DDDD((■"
NM 35 M$="■Z■ZZ■Z■■■■H■■2■■0■■■E■E■E■■■E■D$$D$$E■■$$■D■■D■$■■0E■■00■■E0■■■F■E■■■■HF■F■■■Z■DE■Z■■■B■■ZZ■■I0■■■"
JW 36 M$(91)="■■■■
```

```
AO 60 IF 0C=3 OR 0C=5 OR BC=7 OR 0C=10 OR
   0C=13 OR 0C=17 OR 0C=21 OR 0C=26 OR 0
   C=31 THEN 70
OF 69 GOTO 104
OE 70 Y=Y+1:POSITION 13,10:? "0ONUS LAONG
   NEH":IF 0=0 TO 175:NEXT 0
NQ 71 GOTO 104
PO 72 E=0:? "%":P=0:0=0
WZ 73 U$=N$
YV 74 POKE 710,133:POKE 711,55
WY 75 SOUND 0,0,0,0:SOUND 1,0,0,0:FOR D=5
   3249 TO 53251:POKE D,0:NEXT 0:BH=5
RO 76 0U=0D+1:D$(0D)=0$:0S=SOUNO 2,27,6,0H*(
   0H>=0)+SUONO 3,20,6,0H*(CHI)=0)+0H=0H-0
   .2
WJ 77 IF 0D=113 THEN 04
KQ 78 IF BD=90 THEN POKE 710,131
QZ 79 IF BD=95 THEN POKE 710,96:POKE 711,
   52
RQ 80 IF BD>103 THEN 0$(113-B0)="■"
ZV 81 IF BD=103 THEN PUKL 710,120
QX 82 IF 0D=110 THEN PUKE 710,112
ZW 83 FOH D=1 TO 15:NEXT 0:GUIO 76
OS 84 POKE 718,0:POKE 711,0:POKE 709,15
50 85 POSITION 17,0:? "HITS: ";0F:POSITIO
   N 15,12:? "0ONUS: ";0(*0C*180
IF 86 W=W*0F*0C*100:FOH D=0 TH 600:NEXT D

WZ 87 GOYO 59
IJ 88 GHAPHICS 8:POKE 752,1:POKE 710,0:PO
   KE 709,15:POSITION 12,0:? "■■■■■■■■■■■■
   ■■■■■■■■■■■■■■■■■■■■■■■■■■■■
```

GRAPHICS 9 PICTURE LOADER

By Ray Irish

You can quickly and easily load and display your Graphics mode 9 pictures with this simple loader program. When you RUN it, the program displays a menu listing picture files on the disk in drive 1. To load a picture, press the corresponding letter on the menu. Once the picture appears onscreen, you can "tint" the picture by pressing any key. Press [RETURN] to go back to the menu.

This program loads pictures in the 62-sector ComputerEyes format. The menu only lists picture files with the appropriate .PI9 extenders (see line 19).

By changing constants to variables, using low line numbers and heavy line compacting, I was able to dramatically reduce this program's run time and memory use. It really shines when used with an autoboot — that way you can even delete DUP.SYS and fit an extra picture on your data disks.

```
0 Z=8:W=1:U=W+W:U=S:T=255:S=U+U:A=T+W:Q=7
64:P=S+W:O=S+U:N=560:M=718:GOTO 18
1 OPEN #W,U-W,Z,F$:GRAPHICS S-W:C=PEEK(88
)+PEEK(89)*A:D=USR(ADR(E$),C,7680):CLOSE
#W
2 K=PEEK(Q):IF K=O THEN RUN
3 IF K<T OR K>T THEN POKE M+U,Y:POKE Q,T:
Y=Y+16:IF Y=248 THEN Y=Z
4 GOTO U
5 INPUT #W,F$:POSITION O,G:G=G+W:IF G>S+U
+U+W THEN G=S+U+U:GOTO U
6 IF F$(U,S)="FREE S" THEN POKE Q,T:OPEN
#U,U-W,Z,"K:":GOTO S+U
7 B$="":FOR J=W+V TO S:IF F$(J,J)=" " THE
N GOTO S-W
8 B$(LEN(B$)+W)=F$(J,J)
9 NEXT J:IF F$(S+W,S+W+U)="    " THEN GOTO
 P
18 B$(LEN(B$)+W)=".":B$(LEN(B$)+W)=F$(S+W
,S+U+W)
11 A=(S+U-LEN(B$)):IF A<W THEN GOTO S+W+U

12 FOR J=W TO A:B$(LEN(B$)+W)=" ":NEXT J
13 TRAP S+U-W:? C$(G,G);"";:? F$(W,W);B$
;F$(S+U,S+U-W)
14 A$(LEN(A$)+W)=B$:GOTO U
15 TRAP S+U:CLOSE #W:POSITION S+U+W,18:?
"[REVERSE]Press [RETURN]";:POKE Q,T:GET #U,E:E=E-
64:IF E<W OR E>S+W THEN RUN
16 F$=D$:B$=A$(E*O-P,E*O):FOR I=W TO S+U:
IF B$(I,I)<>" " THEN F$(LEN(F$)+W)=B$(I,I
)
17 NEXT I:E$="hÛÛÛÛÛÛÛÛhÛÛÛÛÛÛÛÛhÛÛÛÛÛÛÛÛhÛÛÛÛÛÛÛÛ Ûß
#":CLOSE #U:GOTO W
18 GRAPHICS Z:POKE M,Z:POKE 752,W:B=PEEK(
N)+A*PEEK(N+W):DIM A$(N),B$(S+S),C$(S+U+U
),D$(U+W),E$(S+S+S),F$(S+S):H=Z
19 POKE B+S-W,U+W:POKE B+S,U+W:D$="01":C
$="*****ABCDEFGHIJK":B$=D$:POKE M-U,S:B$(
LEN(B$)+W)="*.PI9":G=U:POKE 82,W
20 POKE 65,Z:OPEN #W,U+W,Z,B$:POSITION U,
U:? "     Antic's GR.9 Picture Loader#":?
" * VARIETY DISK *"
21 POSITION U-W,19:? "At Pic:[RETURN]-Menu
[REVERSE]T-Tint":? "                62 Sector w/.PI9
ext.":POKE 588,W:GOTO U
```

P:R: CONNECTION HELP

By David Mitschelen

ICD's P:R: Connection is a popular printer and serial interface for the Atari 8-bit. It connects your Atari to the rest of the world — but sometimes that connection can go bad. The following tips may help you track down any problems you may be having with your P:R: Connection.

(The ANTIC staff was not able to verify that all these wiring tips are correct. As always, ANTIC is not responsible for any damage that may result from hardware modifications mentioned here. Also, be aware that opening or modifying any device may void its warranty, if any.)

If your printer doesn't work when attached to the P:R: Connection using the standard cable, check to make sure the cable has the shielding wire or foil grounded to the printer chassis (but not to the interface). Many printers won't require the connection, but my bargain-basement NEC PR105 just sat there without it.

If your printer saves paper but makes a mess of your message by printing over the same line, you need a carriage return with line feed. Software will often handle the problem during setup, or you can change a dip switch in the printer. But if it's a common problem for you, the easiest solution may be to change the jumper inside the P:R: Connection. There are two internal jumpers. One disconnects the parallel interface if it causes problems when using the serial connection, and the other changes the default carriage return without line feed into a carriage return with line feed.

The serial port on the P:R: Connection is used for connecting to a modem or to another computer through a null modem cable. Null modems seem to cause more problems than modems. A null modem is a handy way to transfer text or data files between non—compatible systems or disk formats. It does away with the need for a modem and telephone line, and allows faster sending rates than many modems can handle.

The only problem is getting the null modem to work, since the normal wires have to be crossed: send goes to receive, etc. The bare bones send/receive/ground connection won't work if your terminal program, such as 850 Express, checks for a carrier signal. The standard null modem configuration from Radio Shack and ANTIC (July 1984, page 46) connected

all the pins, but didn't work with my NEC Starlet. Noticing a short remark in the P:R: Connection manual that the Clear To Send (CTS) should be connected to the Data Set Ready (DSR), I rewired my null modem as shown below. I can now successfully transfer data in both directions. I hope one of the three configurations below, for connecting a 25 pin RS-232 to an Atari 9-pin interface, will bring you success, too.

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ICD, 1220 Rock Street, Rockford, IL 61101. (815) 968-2228. Also requires $14.95 ICD cable.

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	Radio Shack	ANTIC's	Mine
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2 (XMT)	4 (RCV)	4	4
3 (RCV)	3 (XMT)	3	3
4 (RTS)	8 (CTS)	7 (RTS)	2 (DCD)
5 (CTS)	7 (RTS)	8 (CTS)	1 (DTR)
6 (DSR)	1 (DTR)	1	1
8 (DCD)	1 (DTR)	2 (DCD)	7 (RTS)
20 (DTR)	2 (DCD) & 6 (DSR)	6	6 & 8 (CTS)

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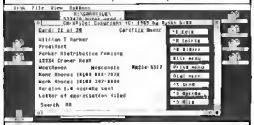

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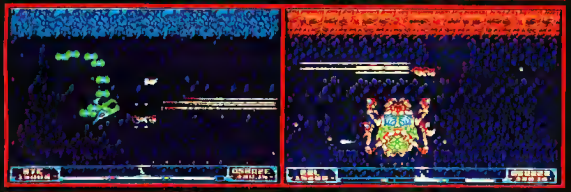

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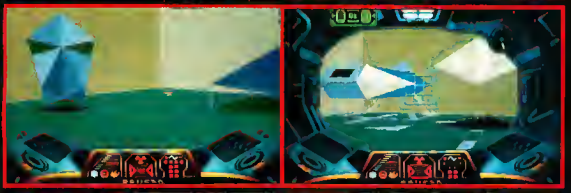

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	TH8001	ANARCHY	$39.99	
	TH8002	INFESTATION	$39.99	
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GOLDEN IMAGE
Introduces...

The MASTER 3SD
3½" FLOPPY DISK DRIVE
WITH LED TRACK DISPLAY

ATARI® ST™
FULLY COMPATIBLE

- FULL 1 YEAR WARRANTY
- QUALITY DRIVE MECHANISM
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- PASS THROUGH CONNECTOR FOR DAISY CHAINING
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OPTICAL MOUSE
NO BALL

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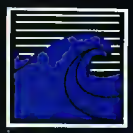

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